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The Artificial Eruption of Malposed Teeth

M. S. STROCK, D. M. D., Boston

DIGEST

The problem of exposing unerupted teeth for the purpose of aiding them to erupt is discussed in comparison with old methods of attempting this and a newer method by which this eruption may be accomplished.

The procedure described here combines the use of surgery and orthodontia in the following steps which are outlined in detail: (1) the complete uncovering of the crown of the tooth; (2) the enlargement of the crypt, the crown serving as a guide for instrumentation; (3) the creation of a trough through which the tooth may erupt; (4) the maintenance of this space by means of a celluloid crown form which also maintains the surgical dressing after the operation.

The advantages offered are (1) the uncovering of teeth formerly considered hopeless; (2) the shortening of the time required for orthodontia, and (3) diminished postoperative pain and after-care.

SIX YEARS AGO a technique was presented[1] for stimulating malposed and unerupted teeth to erupt. In the six years that have elapsed since the technique was first used nearly one hundred teeth have been caused to erupt by this method. It would be well to study the method and compare it with the older methods, so that its advantages may be seen.

The problem of exposing unerupted teeth for the purpose of aiding them to erupt has for many years occupied the attention of surgeons and orthodontists. Fifteen years ago a tooth was uncovered by lifting off only that small portion of mucoperiosteum which overlay the most accessible surface of the unerupted tooth. The small gaping opening was then usually stuffed with an iodoform pack, pressed so tightly that it was held by the resultant swollen edges of the wound. Those few surgeons who were called on to do several of these operations were discouraged by the tissue necrosis that followed this procedure. The wound was repeatedly packed, but secondary infection often occurred. Once healing began, however, it proceeded with such rapidity that often the uncovering operation was unsuccessful because of the resulting scar tissue.

Only an operator who has had to pack and repack these wounds can understand the brutality of such a procedure. The ordeal was so great for both child and surgeon that anesthesia often became necessary for the dressings.

The next development in the operation came as a suggestion from the orthodontist. Before the operation a large loop spring was constructed to overlay the area to be uncovered. This spring was so devised as to rest on the pack to prevent it from being dislodged. About that time doubt arose as to the wisdom of packing wounds. Surgeons who used lighter dressings found this loop spring to be an advantage, because it permitted them to place a small dressing over the exposed tooth. It held this dressing in position and in this way prevented the painful repackings.

At that time also it was not at all uncommon to use some sort of mechanical device to maintain the opening which had been created in the soft tissue. We were taught that modeling compound or base-plate guttapercha could be attached to such a loop spring and by pressure would maintain the opening. It was still customary in those days for the surgeon to drill a hole in the crown itself and insert and cement a pin into the drilled hole. Some operators modified this by the combined use of loop and ligature. Often the only requirement for the oral surgeon was to uncover the crown sufficiently so that the hole could be drilled and the pin ce-

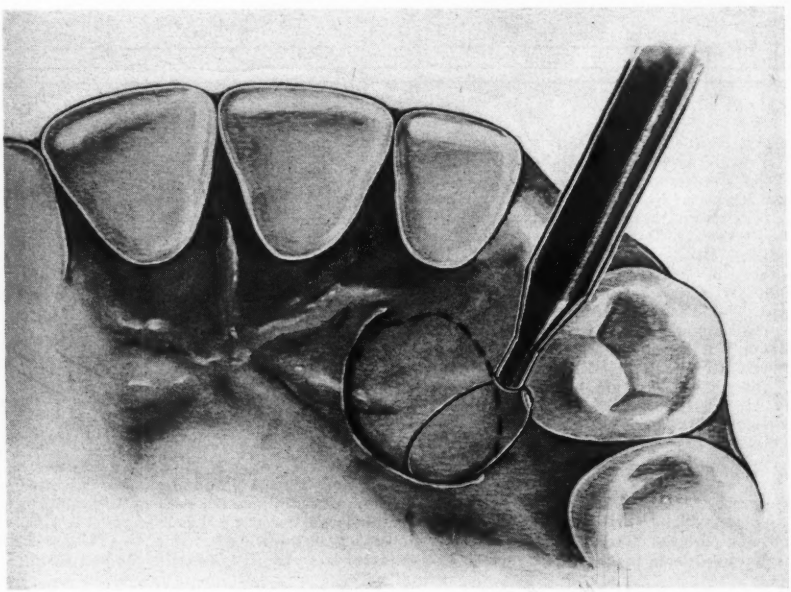


Fig. 1—Loop of electrosurgical scalpel cutting into gum tissue. Dotted line indicates location of tooth.

[1]Strock, M. S.: A New Approach to the Unerupted Tooth by Surgery and Orthodontics, Am. J. Ortho. & Oral Surg. 24:626 (July) 1938.

mented. At the end of six years' observation, I now believe that it is never necessary to drill a hole into the crown of a tooth for the purpose of cementing therein a loop.

In the fall of 1927, I had a patient with a malposed and unerupted maxillary cuspid. At that time it was customary to take an impression of the cuspid on the other side and to make a band extending from it for the unerupted tooth. Several weeks after the operation an attempt was made to cement a band, previously fitted to the opposite cuspid and then readapted as well as was possible to the unerupted tooth. Being both the surgeon and the orthodontist, I attempted to combine the two procedures; that is, to cement the band at the time of the operation. This attempt was a failure. At the same sitting, therefore, I took a copper band impression of the unerupted tooth and temporarily applied base-plate gutta-percha to the loop spring which had been previously prepared and which was supported on a lingual arch wire. Into this copper band impression, amalgam was packed, a die prepared, and a cast made which fitted over the lingual aspect and the incisal edge of the unerupted cuspid. Fortunately the casting fitted well and stayed in position at its first cementing.

In the years since 1928, although practicing surgery, I had continued to maintain an interest in orthodontia, and had often volunteered to take a copper tube impression of the exposed tooth for the referring orthodontist while the tissues were anesthetized, thus enabling him to make his own amalgam die and to fit the band.

About that time surgical paste as dressing material came into practice. It has since then so greatly increased in popularity that it is now rare for gauze alone to be used as a wound dressing. At first surgical paste was incorporated in a gauze tape. Such a procedure had long been known in general surgery where boric acid gauze was an old favorite. These pastes, combining antiseptic and anesthetic properties, filled an important need and became popular. They allowed packs to remain for greater lengths of time without change and when they were removed were less painful, inasmuch as the lubricating jelly prevented their adherence to the tissue surface.

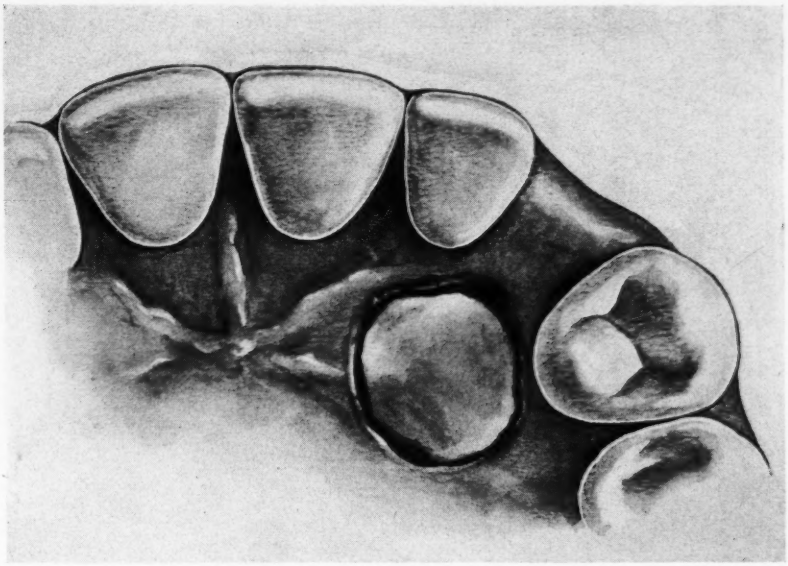


Fig. 2—After gum tissue is removed. After the gum tissue has been exposed the crown of the tooth cannot be seen. The tooth is still covered by bone and membrane which is thin at the incisor edge and thicker at the periphery.

From this lubricated gauze dressing we soon learned that the lubricant itself was a good dressing material, and thus began to use it alone in bone cavities. In these partly uncovered teeth, however, it was difficult to keep the lubricant in place. It occurred to me that a celluloid crown form would be ideal for maintaining the dressing.

Procedure

The successful performance of the operation depends largely on the temperament of the child. In some instances premedication may be necessary. In two cases of our series it was found necessary to resort to a general anesthesia.

Parents hesitate to have this procedure carried out if they are alarmed by the seriousness of the operation. Both child and parent should be as-

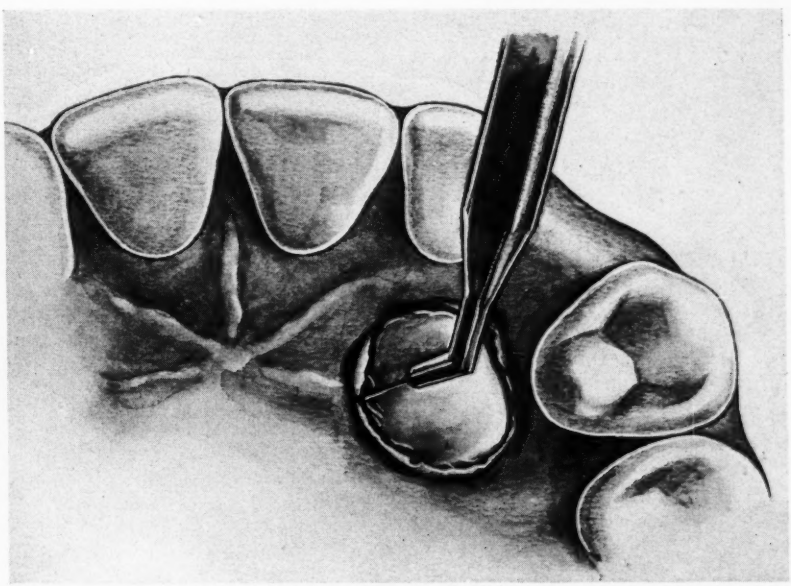


Fig. 3—Needle electrode coagulates the remnants of the dental sac so that it can be readily removed.

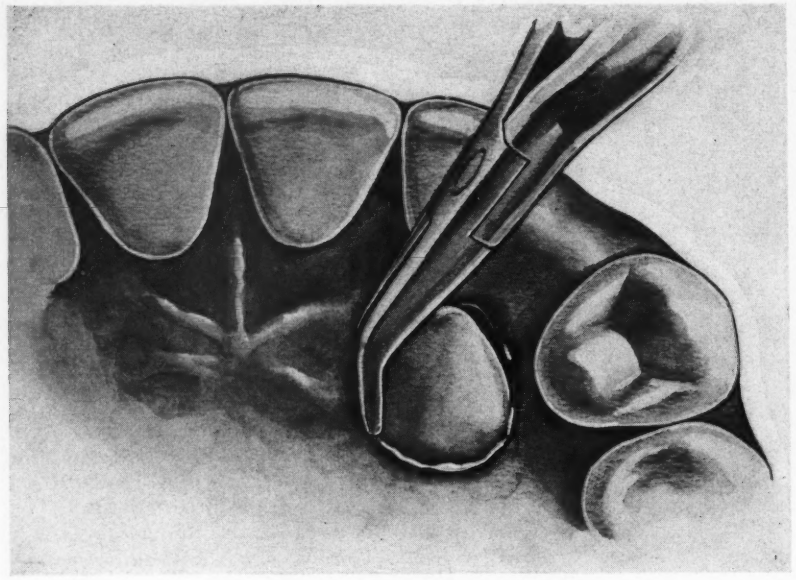


Fig. 4—Rongeurs dissecting overlying bone.

sured, therefore, that the operation is a simple one, although time-consuming. The first visit is spent in securing the child's confidence, in obtaining photographs and sufficient roentgenograms to localize the tooth properly. The Clark method of localization and stereoscopic roentgenograms may be used to localize the tooth further. Regular dental films, occlusal views, and lateral head plates are often helpful.

At the time of operation, materials are set up before the child is brought into the room; no time is lost between seating the patient and preparing the field for operation. Soap and water are used to prepare the field. In applying drapes the field is isolated as completely as possible. The patient's hair and eyes are covered. This procedure has distinct advantages, and once the child's confidence is gained, he is better off if he is unable to see what is going on. Procaine hydrochloride is usually infiltrated about the tooth, although block anesthesia may be used if indicated.

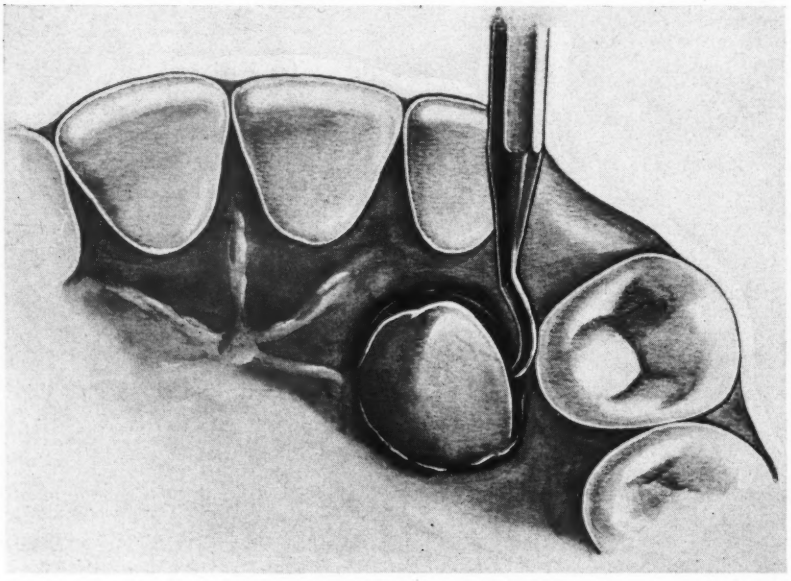


Fig. 5—Tooth exposed entirely.

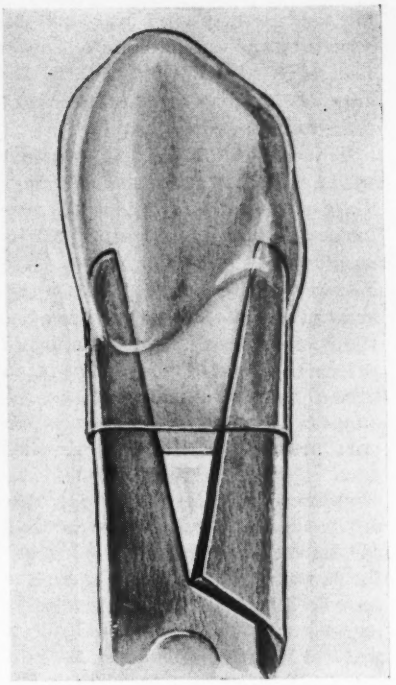


Fig. 6—Neck of celluloid crown form being stretched with heated pliers.

Fig. 7—Neck of form trimmed with a crown and bridge scissors having a curved beak.

The Operation—The operation consists of (1) the complete uncovering of the crown of the tooth; (2) the enlargement of the crypt, the crown serving as a guide for instrumentation; (3) the creation of a trough through which the tooth may erupt; (4) the maintenance of this space by means of a celluloid crown form.

Exposure of the Tooth—The tooth is exposed by a general excision of the overlying mucoperiosteum. The flap is not laid back; it is completely excised. This is best carried out by electrosurgical scalpel, but the knife, mucoperiosteal elevator and punch can be used. In the last two years in all our cases the excision of this soft tissue has been done with the electrosurgical scalpel. The loop dissects off the mucosa, and the unipolar needle inserted in the crypt actually coagulates and contracts the membrane about the crown, so that it is more readily removed. In only two cases was it found necessary to divest the crown of its bony covering by means of the chisel and mallet, and these cases were of the oldest patients in whom maxillary cuspids were malposed high in the palate. Usually the dissection of the overlying bone can be carried out with hand-pressure chisels, scalers, and tiny rongeurs. With a fine pair of rongeurs the overlying bone is dissected away until there is no overhang.

Maxillary cuspids require the removal of more bone than any other teeth, and are much more difficult. If the deciduous cuspid is still in position and its removal seems indicated at the time of operation, this provides an approach which somewhat simplifies the operation. If the deciduous tooth is carious and the space occupied by it is narrow, the operation is more difficult. If no space exists, it is even more difficult to provide suitable access. Whether or not the arch should be widened and the space for the cuspid created before surgery is attempted is a problem which must be given careful consideration. Exposure of the unerupted tooth must be complete and entirely adequate for access to its crypt.

Establishing the Trough — When the tooth is thoroughly exposed, it is then possible to grasp the soft saclike portion of the tooth follicle with a fine hemostat. It must be torn away piecemeal. A pair of Columbia right and left scalers are useful for this procedure. It is then possible to enter the crypt, gradually pulling away portions of this membrane until the cemento-enamel junction can be felt. Occasionally Whitten scalers and pyorrhea files will be found serviceable. Files, such as those formerly used in gingivectomy, may be of help. It should be possible to pass a scaler completely around the crown of the exposed tooth in all directions. Occasionally, with maxillary cuspids which lie impacted against the lateral incisors, some difficulty will be encountered because the crown of the tooth impinges so tightly. Force should not be used, however. It is wiser to leave the point of contact and to adjust or adapt the crown form later, so that this contact point is avoided. The operation proceeds leisurely, and with suction apparatus at this stage is not unlike a scaling operation.

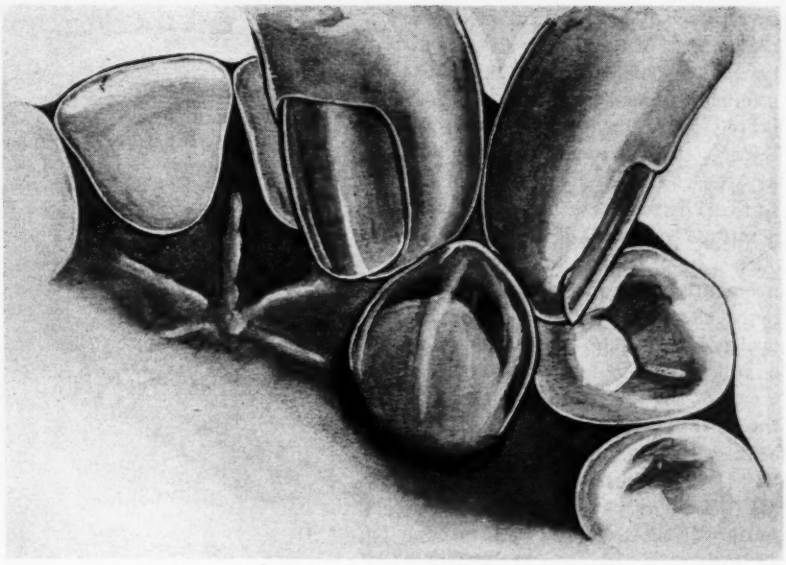


Fig. 8—Crown fitted on tooth.

Maintaining the Trough—Having first carefully dried the exposed tooth and crypt, the surgeon visualizes the

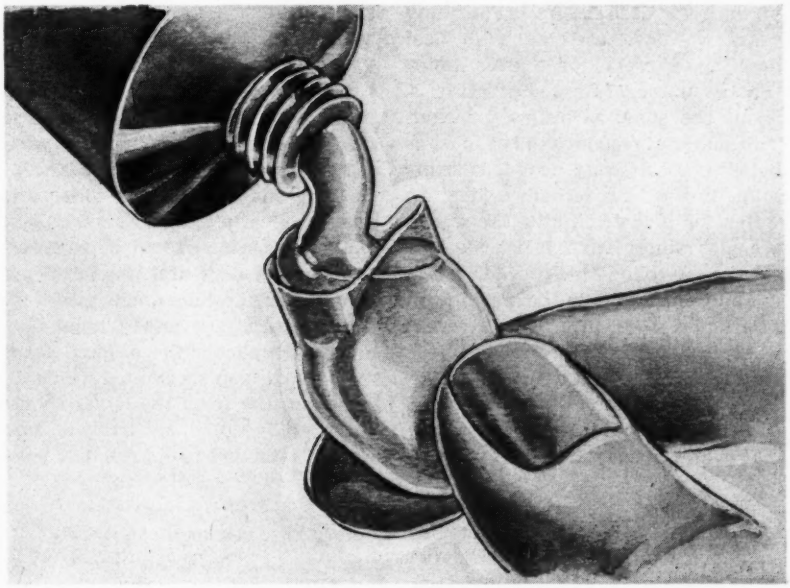


Fig. 9—Crown being filled with ointment. Note how edges of crown form are festooned.

newly uncovered tooth and selects the crown form of the proper size. An inexpensive pair of band stretching pliers are flamed until they are moderately hot. The neck of the crown form is then stretched, so that it is as wide as the greatest width of the form. The neck of the form is cut with a pair of crown-and-bridge scissors to such a bevel that it will slide by the projecting mucoperiosteum (inasmuch as the tooth lies in an unnatural position). The crown form is so adapted that it fits snugly on the crown of the tooth and is retained by the tightness of the fit. It need not be forced on completely. In some cases there is a distinct advantage in leaving the form long, because muscle force will tilt the tooth into proper alignment. If the form is left long, moreover, the stimulation of mastication is beneficial and causes an earlier eruption of the tooth.

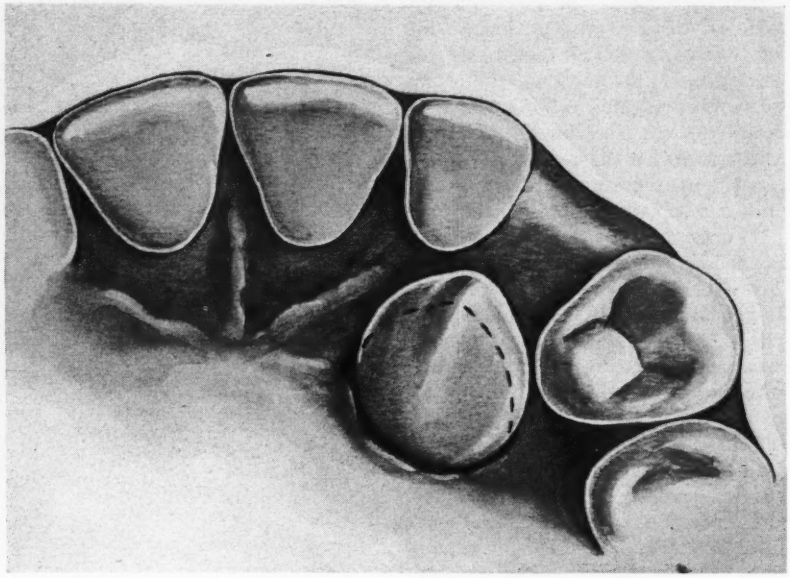


Fig. 10—Crown applied to tooth.

After the crown form has been adapted, it is then filled with an ointment and pressed into place. This ointment is of value for several reasons. The grease helps to create a suction which maintains the forms in place. It is obtundent and slightly antiseptic. It also prevents the accumulation of saliva and food. Experience has proved that forms may be left on without changing the dressing for a week or ten days. We do not believe it makes any essential difference what ointment or cream is used, provided it contains the ingredients that produce the desired effect. For many years we have used as a surgical dressing, a cream of a consistency that at a moderate temperature is about the same as ordinary butter. This material responds to heat just as butter does. At body heat it is semisolid. If the tube is held under hot water for a few minutes the cream becomes almost liquid. It has been our practice to follow this procedure and to apply the cream to the crown form in a liquid state. In a few seconds it is semisolid. It is then applied to the tooth and is sprayed with cold water. The excess cream is wiped away, and the patient is ready for dismissal.

It is important that this process be well understood. This celluloid crown form containing the semisolid cream is not cemented on in any sense of the word. Surgical packs and other materials that become hard after their application to the tooth should not be used. The only reasons for filling the form with any material is for the germicidal effect and in order to increase the suction by which the form is held in position. Many solid substances would be likely to act as irritants and offset the value of the crown form. The formula of the paste that I use is as follows:

Camphor	6.5 parts
Metacresol	3.5 parts
Petrolatum (melting point 40° to 50°C.)	50.0 parts
White wax	10.0 parts
Hydrous wool fat (lanolin)	30.0 parts

The form should be sterilized by flushing in scalding hot water and then soaking in iodine. At subsequent visits the ointment can be renewed. It is unnecessary and unwise to use a new form at subsequent visits, for a new form can never be trimmed exactly to duplicate the original form. This makes replacement difficult. In removing the form the labial should be carefully noted, so that the form will be returned to its original position each time. If these precautions are taken there will be no difficulty in maintaining the form for as long a period as is necessary, which is usually six weeks.

Advantages

1. This procedure makes possible the uncovering of teeth considered hopeless.
2. It shortens the length of time required for orthodontia.
3. It diminishes the amount of postoperative pain and after-care.

Comment

The method described here, I believe, should be called to the attention of every orthodontist and every practitioner. Teeth, which hitherto have been allowed to remain unerupted and malposed, although recognized earlier in life, should be reviewed with the possibility of making them functioning members of the dental arch.

The application of this technique should be considered in such cases in which the orthodontist has already started treatment but in which the teeth have failed to respond to the older methods of uncovering.

Peter Bent Brigham Hospital, Boston.

Leukemias

FLOYD E. STRAITH, D. D. S., Detroit

LEUKEMIAS PRESENT so many manifestations in and about the mouth that every dentist should be aware of their diagnostic significance. Leukemia, briefly, may be stated to be a condition arising from a disturbance of the blood-cell-forming tissues of the body, resulting in a relative or absolute increase in the number of mature or premature white cells in the blood. The disease may be either acute or chronic but is always fatal. The chronic cases may have acute exacerbations.

Leukemic cases are divided into lymphatic, myelogenous, and monocytic types. The lymphatic type is characterized by enlargement of the lymphoid tissues, particularly the cervical, axillary and inguinal glands. The blood studies reveal a large increase of lymphoblasts. The myelogenous type presents almost the same picture as the lymphatic but generally with a marked enlargement of the spleen. Myelocytes and pre-myelocytes are predominant in the blood studies. The monocytic type is believed by some to revert to the myelogenous type and presents a large increase in monocytic elements in the blood.

The onset of the disease may be sudden or over a period of several months, and is characterized by increased weakness, fatigue and rise in temperature. These are the general symptoms apt to be noted by the dentist. The more specific oral manifestations are hypertrophy of the gum tissues, particularly of the lower jaw; pain in the gums or teeth without any apparent cause; bleeding from gum tissues (particularly in the myelogenous type) or persistent hemorrhage following surgery; petechial hemorrhages beneath the mucosa, and oral sepsis of the type seen in Vincent's infection, with ulcerative or sloughing lesions. Any one of these complaints, or a painless progressive enlargement of the cervical, submaxillary and submental lymph glands may prompt the patient to seek the aid of a dentist.

Monocytic Leukemia

Frequent mention is made in the medical and dental literature of the oral manifestations of blood dyscrasias and leukemia in particular. One occurrence which is frequently mentioned is the hypertrophy of the gingival tissues accompanied by a purplish discoloration of those tissues. Another occurrence often mentioned as one of the first manifestations of a leukemia is spontaneous hemorrhage from the gingivae.

The following case report is significant in that the oral symptoms were confined primarily to a rapidly occurring hypertrophy of the gingivae and gingival necrosis. There was no history of hemorrhage and the change of color in the gingival tissues was not marked.

DIGEST

***Definition*—Leukemia is a condition arising from a disturbance of the blood-cell-forming tissues of the body, resulting in a relative or absolute increase in the number of mature or premature white cells in the blood. The disease may be either acute or chronic but is always fatal.**

***Diagnosis*—The types of leukemic cases and their definite individual characteristics determining their diagnosis are described, particularly with reference to oral manifestations.**

***Report of Cases*—Complete and detailed reports of a case of monocytic leukemia and of acute lymphatic leukemia are given.**

***Purpose of Article*—Leukemias present so many manifestations in and about the mouth that dentists should be aware of their diagnostic significance. Patients suffering from leukemia particularly or any blood dyscrasia are susceptible to infections of the oral tissues, and surgical procedures are contra-indicated. Because of these disturbances in the mouth or enlargement of the cervical, submaxillary and submental lymph glands, the patient may go to his dentist before seeking the aid of a physician. Dentists must, therefore, be aware of the possibilities.**

Report of a Case

February 13, 1940 a white, married woman, aged 36, a bookkeeper by occupation, was referred by her dentist because of pain and swelling about the lower left impacted third molar with ulceration of the buccal gum tissue opposite the lower left molars.

History—The family history was not of consequence. The patient who was obese had been in good health until about two years before, when she was treated for "liver trouble." At that time she was unable to swallow food for one week. Recently she felt exhausted and complained of a dry nonproductive cough, difficulty in breathing, and, within the previous two weeks, the loss of 10 pounds. Two weeks before presenting, the gum tissues on the lower left from the molar region across the midline to the right cuspid became swollen and red, extending about the tops of the teeth, accompanied by a painless swelling beneath the left mandible. There had been no bleeding from the mucous membranes of the mouth.

Examination — Examination disclosed a dusky pallor to the skin and rather pale mucous membranes. The gingival tissue on both lingual and buccal of the teeth of the mandible from the incisors distally to the lower left molars was swollen, reddened, loosened, and elevated to a point at which the interdental papillae projected above the incisal edges (Fig. 1).

Fig. 1—Marked hypertrophy of gingivae of lower left mandible and incisor region. Note submergence of incisors. (Reproduced from 16 mm. Ciné kodachrome film, "Oral Pathology.")

On the buccal of the lower left molars, was a grayish sloughing area of gum tissue extending down to the buccal fold. The mucosa in the third molar area was swollen, red, and distended both on the buccal and lingual. The left tonsil area, particularly, was inflamed and enlarged.

Digital palpation of the tissues over the left mandible revealed a boggy thickening of the muco-periosteum and gingivae with slight tenderness on pressure over both buccal and lingual surfaces. There was no evidence of fluctuation or discharge.

Roentgenographic examination of the left mandible revealed a horizontally impacted third molar with its crown directed anteriorly to but not in contact with the distal root surface of the second molar. There was evidence of pocket formation along the distal root of the second molar, involving the crown of the impacted third molar. There was no evidence suggesting a periostitis or osteomyelitis.

Diagnosis—On the basis of the hypertrophy of the mucous membranes, pallor and history, a provisional diagnosis of leukemia, secondary anemia and subacute Vincent's infection was made.

Laboratory Report — The patient was referred for blood study. The report from the laboratory was as follows:

Red blood count: 2,980,000 per cubic millimeter; hemoglobin, 63 per cent; color index, 1.06. Red blood cells are fairly normal in size, shape and staining quality; one megaloblast was found. White blood count: 15,100 per cubic millimeter. The differential count showed: polymorphonuclear neutrophiles, 26 per cent; nonfilamented, 11 per cent; filamented, 15 per cent; lymphocytes, 60 per cent; monocytes, 9 per cent; eosinophiles, 0; basophiles, 0, and lymphoblasts, 5 per cent. Smears and cultures from the necrotic area in the mouth revealed a high incidence of Vincent's organisms in addition to the usual mouth flora.

The patient was referred for medical care. Further blood studies were made at Harper Hospital with the following report to the attending physician:

Red blood cells, 2,500,000; megaloblasts and normoblasts, 2 per cent; mean diameter, 7.18 microns; hemoglobin, 56 per cent; color index, 1.1; thrombocytes, 97,500; coagulation time, 8 minutes, and bleeding time, 15 minutes. The white blood count revealed: Leukocytes, 11,350; neutrophilic myelocytes, 1 per cent; metamyelocytes (juvenile), 1 per cent; neutrophiles (stab), 7 per cent; neutrophiles (segmented), 20 per cent; eosinophiles, 1 per cent; basophiles, 1 per cent; lymphocytes, 31 per cent; monocytes, 26 per cent, and monocytoblasts, 12 per cent. The blood Wassermann and Kahn reactions were negative.

Bone marrow studies and blood studies done February 19, 1940, were reported by Doctor Sharp of the Anaemia Clinic at Harper Hospital as follows:

Severe erythrocytopenia, microcytic and hyperchronic, manifesting regenerative tendency. The thrombocytes are below normal. The coagulation and bleeding times are prolonged. The white blood pattern shows extreme neutropenia with a left myeloid shift. Lymphocytosis and monocytosis are marked and account for the slight increase in the leukocytic concentration.

Bone marrow: Examination of the marrow confirms the findings in the peripheral blood. Both immature mononuclears are present in high concentration —the reticulo-endothelial variety exceeding the lymphoid type.

Impression: This blood pattern is leukemoid, suggestive of the monocytic reticulo-endotheliosis of Schilling. Mitotic monocytoblasts are numerous, indicating an active proliferating process. On the basis of past experience with similar leukemoid disorders, the clinical course is progressively malignant. All forms of therapy are ineffective.

Treatment and Course—Mapharsen .04 Gm., twice weekly, was recommended and used to good effect in controlling the mouth ulcerations due to Vincent organisms. Repeated blood transfusions were given varying from 350 to 500 cc.

On April 16, the patient was transferred to Lakeside Hospital in Cleveland under the care of Doctor Joseph Wearn.

The patient returned home from Cleveland on June 5, 1940 feeling stronger but having lost another 40 pounds. The gum tissues were not so markedly hypertrophied and there had been no gingival bleeding.

The following report was sent to Doctor Richard C. Connelly, her local physician by Doctor Robert W. Heinle of Lakeside Hospital, Cleveland:

On admission, the blood findings showed the white blood count, 2,050; red blood count, 2,030,000; hemoglobin, 37

Fig. 2—Marked enlargement of sublingual, submaxillary, anterior and posterior cervical and posterior auricular lymph glands. (Reproduced from 16 mm. Ciné kodachrome film, "Oral Pathology.")

per cent; differential count showed 39 per cent polymorphoneuclear leukocytes; 47 per cent lymphocytes; 7 per cent monocytes; 1 per cent myelocytes; 2 per cent blasts and 8 per cent unclassified. There was an occasional nucleated red blood cell and platelets were reduced.

While here she received daily injections, intramuscularly, of 5 cc. Lilly's solution of liver extract, concentrated (2 units per cubic centimeter). This was given not because of the anti-anemic value, but because of the vitamin B_2 complex present in the liver. For the last 14 days she also received some spleen extract of our own manufacture, which apparently did not influence the course of the disease.

Under this treatment, plus ferrous sulphate, 0.64 Gm. t.i.d., her red blood count rose to a maximum of 3,270,000; hemoglobin, 57 per cent. Her white count remained between 1,400 and 2,600. There has been a gradual increase in blasts in the peripheral blood. At discharge the blood findings were: white blood count 2,300; red blood count 2,720,000; hemoglobin, 54 per cent; differential showed 27 per cent polys, 18 per cent lymphocytes, 3 per cent monocytes, 2 per cent eosinophils, 50 per cent blasts.

While here her gums continued to improve markedly and although not entirely normal, they are not bleeding and cause her no trouble. She developed some pain in the right ear with a thin discharge. A small polyp, growing through the tympanic membrane was removed. The ear is still discharging a little. X-ray plates show no involvement of the mastoid bones or other bones of the skull.

Her appetite has remained good; she has been up and around while here and her spirits are excellent. She was sent home with instructions to see a physician at least once a week to try to arrange for daily injections of liver extract if possible, and to continue taking ferrous sulphate. It is probable that we have discharged her just about the time she is ready to relapse again. Our discharge diagnosis was subacute monocytic leukemia.

On June 28 the patient became much weaker and returned to Cleveland where she died one week later. The final report of the blood studies during that week is interesting. The rapid rise in the total white count, the drop in the monocyte count, and the great increase in percentage of "blast" cells will be noted:

Blood Record

Date	Red Blood Count	White Blood Count	Monocytes	Monoblasts	Transfusion	Temperature
2-13-40	2,980,000	15,100	9%	5%		101.2° F.
2-19-40	2,500,000	11,350	26%	12%		
2-29-40						100.8
3- 4-40						100.
3-12-40						99.8
3-18-40						101.1
3-26-40						101.8
4- 1-40	940,000	5,100	27%		350 cc.	
4- 3-40	1,400,000	5,400			350 cc.	
4- 6-40					500 cc.	
4- 8-40	2,150,000	2,600				
4- 9-40					400 cc.	
4-11-40	2,050,000	3,200	30%			

Acute Lymphatic Leukemia

Acute lymphatic leukemia may present manifestations in or about the mouth and jaws of decided clinical and diagnostic importance. The fact that all lymphatic tissue of the body may be involved in this disease, necessarily including those lymphatics in the oral and facial tissues, requires an oral diagnostician to consider leukemia when presented with a case of glandular enlargement.

The following case report demonstrates the necessity of routine blood studies and careful evaluation of the medical history, physical and oral examination, and laboratory observations.

Report of Blood Studies During Last Week

Date 1940	W.B.C.	R.B.C. mil.	Hgb. %	Poly.	Lymph.	Mono.	Eos.	Bas.	Myelocytes	Blasts	Nucleated* R.B.C.
6-29	35750	2.00	35	1.5	6.0	22.0	0	0.5	8.0	62.5	1
7-1	44000	2.83	53	7.0	5.0	11.0	0	0	9.0	68.0	0
7-2	38500	2.43	49	4.0	6.0	15.0	0	0	13.0	62.0	1
7-3	58250	2.20	45	6.0	7.0	6.0	0	0	10.0	71.0	1
7-5	93500	2.37	41	4.0	5.0	7.0	0	1.0	10.0	73.0	0

*Nucleated red blood cells expressed as number seen while counting 100 white blood cells in determining a differential. Platelets greatly reduced to absent in all blood smears. Red blood count showed slight variation in shape and size. Patient received a blood transfusion between the counts of 6-29-40 and 7-1-40. Death occurred on 7-5-40. Autopsy obtained.

Report of a Case

On January 31, 1940, a dentist referred a young man for consultation regarding swollen glands. The patient was a white man, aged 22, married, who gave the following history:

History—The patient complained of not having felt well for several months and that he seemed to be getting worse rather than better. He had been troubled with repeated attacks of sore throat, and three months before, one week following an attack, he had had his tonsils removed. No blood count was done at that time nor were any microscopic studies made of the tissues removed. At that time he had lost 12 pounds which had not been regained. Two weeks before the date of the present examination the patient had experienced pain in or around the lower left molar, and four days following, the lower left second and third molars were removed by his dentist. This was followed by a swelling over the left side of the mandible which gradually receded, but all other glands beneath both sides of the mandible and in the neck became swollen. The only pain had been in the left ear and headaches. He stated that the right and left inguinal glands had been swollen and sore for only one day about one and a half months before. The patient's mother stated that the glands behind his ears and along the sides of his neck were swollen shortly after the removal of his tonsils.

Examination — Examination revealed a distinct pallor, sweating and difficulty in swallowing. There was a marked bilateral enlargement of the postauricular, submaxillary, anterior and posterior cervical, and sublingual lymphatic glands to the extent that the position of each gland was not only readily palpable but visible (Fig. 1). The enlargements varied from pea to walnut size; the swelling of the submaxillary gland was the largest. The axillary and inguinal glands also were enlarged.

The mouth revealed no ulcerations or lesions. The soft palate and pillars of the tonsils were edemic, glossy and a yellowish-pink or red. The temperature was 100° F.; the pulse 98, and respiration 24.

Diagnosis and Blood Report—A provisional diagnosis of acute lymphatic leukemia was made and the patient referred for blood studies. The results were as follows: The red count was 3,740,000; hemoglobin 76 per cent for 11.73 Gm.; color index 1.02; the white blood count was 5,500; polymorphonuclear leukocytes were 4 per cent; lymphoblasts 51 per cent, nonfilamented 3 per cent and filamented 1 per cent; lymphocytes, 39 per cent; monoblasts, 2, and eosinophiles 1 per cent.

Treatment and Course—The patient was immediately referred for medical treatment and was admitted

(*Continued on page* 22)

Flasking Dentures to Facilitate Deflasking

A. H. BROWN, D.D.S., Denver

DIGEST

A method of flasking dentures to facilitate deflasking is described in which the denture is easily and safely removed from the flask without scarring the flask. This is accomplished by the use of metal plates, called cleavage plates, which control the lines of cleavage.

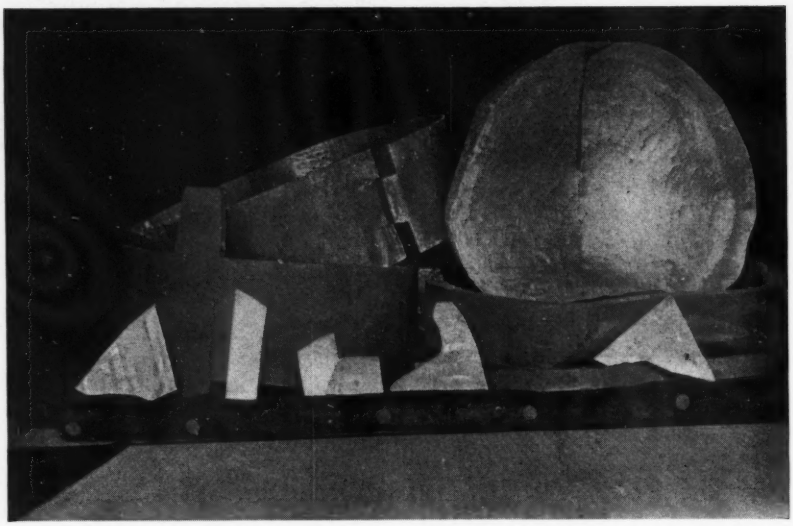


Fig. 1—Flask, liners and cleavage plates.

THE METHOD OF flasking dentures to facilitate deflasking to be described here will be of little interest to those who employ commercial laboratory service exclusively in denture construction; but those who prefer to do their own laboratory work, or, at least, to have a working knowledge of how it should be done may find this method helpful.

I have spent as much as forty-five minutes, and, on occasion, have broken teeth in attempting to remove dentures from flasks. The flasks were dirty and scarred when the work was completed. I am now able to remove a denture from the flask in two or three minutes with ease and safety, leaving the flask unscarred and only slightly soiled.

Equipment

The following equipment is required: a large, roomy flask; metal liners for the flask of about .014 inch brass, and a few pieces of thin tin or any other metal to be used for plates according to the description to follow. The thin metal trays in which teeth come carded may be flattened and used as material for these plates (Fig. 1). I have flasks made to order; however, good results should be obtained through the use of the largest flask procurable for use in a 4½ inch vulcanizer, properly fitted with liners.

Construction of Liners

The liner for the cast half of the flask should be well fitted and trimmed flush with the flask margin. It should be cut from the front along the median line to within one-half inch of its back wall to facilitate its removal from the investment after it has been removed from the flask. The liner for the ring of the flask is merely a strip of metal equal in width to the height of the ring and of sufficient length to come together in front with a tongue on one end and a recess in the other end into which the tongue fits, so that liner will stay in place and in alignment. Both liners should fit accurately at the margins; otherwise, the investment, getting between the liner and flask, will make their removal difficult.

I have been unable to use cardboard, celluloid or cellophane successfully for liners. They must be made of metal.

A suitable brass flask, with liners, should not cost more than five dollars.

Procedure

1. With the liner in place in the cast half of the flask, the waxed case, well soaped, is placed in the position it is to occupy. Soap is used freely at every step of flasking. I like a saturated solution of soap used with a one-inch paint brush, with washing done under running water.

2. Three pieces of thin metal are cut to form "cleavage plates." Inasmuch as the success of the plan depends on controlled lines of cleavage, I use the term "cleavage plates." One plate is positioned back of each heel and one in the median line at the front of the case. The outline of one of the heel cleavage plates would be as follows: Beginning at the top of the heel at a point directly back of the second molar, the upper border would extend downward and backward to the upper edge of the liner. Continuing, the border would extend downward and inward along the liner to the heel of the cast, then upward to the starting point. The anterior plate is likewise fitted to the space between the cast and the liner with its top border on a line from the cast, at the periphery of the wax, to the top of the liner in the median line. It is entirely unnecessary that these plates fit spaces accurately—approximately is sufficient.

3. The cast is invested in the usual way in the cast half of the flask, one part stone to two parts plaster being used as investment.

4. When the investment has partly set the plates are inserted in their positions and the investment formed flush with their upper borders (Fig. 2).

5. The case is foiled and soaped.

6. The ring, with the liner inside it,

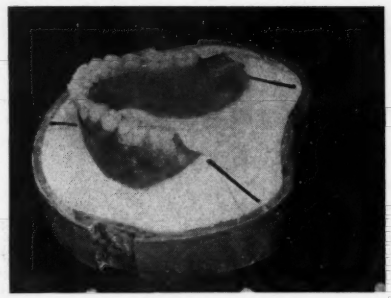


Fig. 2—Case invested in cast half of flask, showing upper borders of plates in position.

Fig. 3—Two cleavage plates in position that they are to occupy in ring.

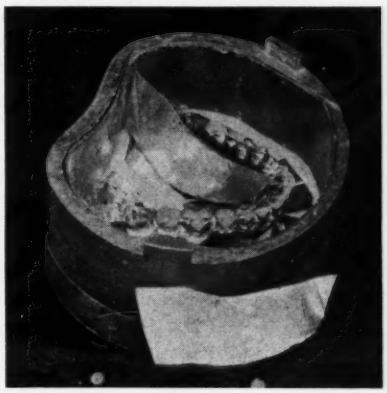


Fig. 4—Lingual plates, one in position that it is to occupy.

is placed in position on the cast half of the flask.

7. Cleavage plates are cut as previously, the upper borders of those at the heels extending upward and backward from immediately back of the second molars to the top of the liner, and their outlines approximately fitting the space down to the investment in the cast half of the flask (Fig. 3).

8. In lower cases in which difficulty is anticipated in removing investment from the lingual area, such investment may be cored for easy removal by the use of two cleavage plates with the following outlines: Beginning at a point just lingual to the incisal edges of the lateral incisors the outlines extend backward on a level with the occlusal surfaces of posterior teeth; then upward and backward to the top of the ring liner about one-inch each side of the median line; downward along the liner to the investment in the cast half of the flask; then forward and upward along the investment, the cast and wax to the starting point (Fig. 4).

9. Investment, one part stone to two parts plaster, is run in the ring to within one-half inch of the top.

10. These plates, with the plates previously referred to, are placed in position in partly hardened investment, converging from their back edges forward and inward and from their top edges downward and inward.

11. With the fingers the investment is worked out to expose the occlusal surfaces and incisal edges of teeth and the top edges of plates—five plates if lingual plates are used—the investment being pressed outward and upward to the top of the ring liner. Excess investment is discarded (Fig. 5).

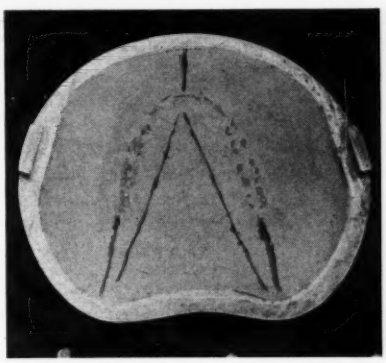


Fig. 5—After first investment in ring, showing upper borders of five cleavage plates.

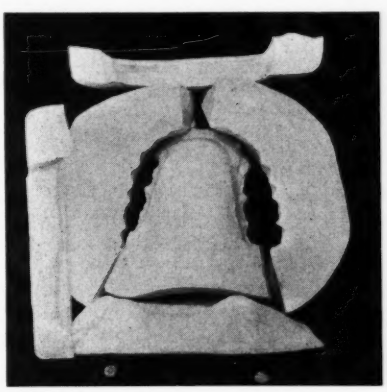


Fig. 6—Parts of investment, separated at cleavage lines.

12. The case is soaped, filled to the top with investment (two parts stone to one part plaster), and the cover of the flask is placed in position.

13. When the investment is hard, the wax is removed, the case foiled, packed and cured in boiling water as usual. The investment should not be disintegrated by heating to high temperature; it comes away easier and cleaner if it is hard.

14. When cool, the flask is separated. The liner in the cast half of the flask will come out with the investment. The top of the flask is removed. The lower edge of the ring is rested on two blocks to keep it off the bench, and the investment and liner are pressed out of the ring. Liners are removed from the investment. By tapping the top of the investment with a horn mallet, the sides and top investment will come away in five pieces, dividing at cleavage lines (Fig. 6). Investment in the palate of the upper, or in the lingual area if it is a lower case, is removed, only the cast and denture being left.

15. By holding the denture in the hand with the teeth against the palm and tapping the cast with a horn mallet the cast is easily broken. It falls out in pieces except such parts as may be mechanically held in place by undercuts. These must be removed with chisels and burs.

A little more time spent in forming and inserting cleavage plates results in ease, quickness, and safety in deflasking.

317 *Republic Building.*

A Posterior Set-Up to Meet Individual Requirements

S. HOWARD PAYNE, D.D.S., Kenmore, New York

DIGEST

A posterior set-up, modified by grinding, so that the occlusion meets the requirements of tissue tolerance, is presented.

This set-up is offered with the following stated advantages: (1) better adaptation to different types of ridges; (2) greater masticating efficiency; (3) elimination of lateral interference, and (4) settling without unbalancing the articulation by cuspal interference.

The technique described here calls for the use of a two-dimensional or anatomic articulator and the anatomic 30° cusp tooth. The face-bow and condylar path registrations are advised.

FOR THOSE WHO like the anatomic 30° cusp tooth, a modified set-up is presented herein.

This set-up (1) is better adapted to different types of ridges; (2) gives greater masticating efficiency; (3) eliminates lateral interference, and (4) allows for settling without unbalancing the articulation by cuspal interference. This modification by grinding is not complicated. The time consumed is from four to six minutes. The operator will find ease and speed in setting up the teeth.

About nine years ago, Doctor Edson J. Farmer of Buffalo originated this method in his own practice. Since then, with a few improvements added from time to time, the set-up has been used exclusively at the University of Buffalo Dental School.

This technique presupposes the use of a two dimensional or anatomic articulator, such as the Hanau. Face-bow and condylar path registrations are not absolutely necessary but are advisable, especially in the case of the naturally retruded mandible, where there is a long condylar path, and consequently, considerable lateral and protrusive excursion is possible.

After the case has been mounted on the articulator and the upper and lower anteriors have been selected and set for esthetics and phonetics, the posteriors are begun.

Technique

1. Cut the wax rims on both the upper and lower baseplates distal to the cuspids, maintaining the correct vertical dimension with the incisal guide pin of the articulator.

2. On a straight line from the tip of the lower cuspid to the center of the retromolar triangle or pear-shaped body, the lower posteriors are set. This line bisects each tooth bucco-lingually, the cusps are horizontal, and the compensating curve corresponds to the condylar registration taken from the patient.

3. With a mandrel-mounted half-inch stone turning bucco-lingually, grind the buccal and lingual inclinations and transverse ridges without destroying the anatomy of the entire occlusal surface (Fig. 1). The end-result is a tooth with approximately a 20° bucco-lingual-occlusal inclination and with the greater part of the mesio-distal interference removed at

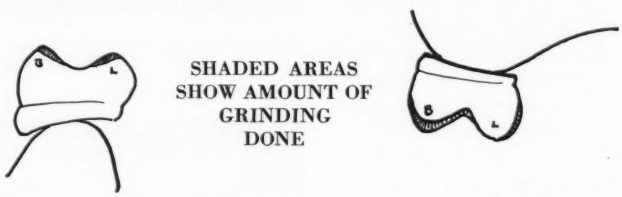


Fig. 1

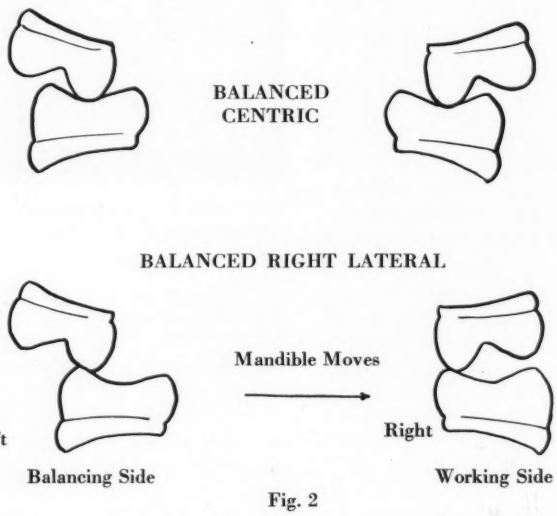


Fig. 2

VARYING CONTACT AREA FOR DIFFERENT TYPES OF RIDGES BY GRINDING

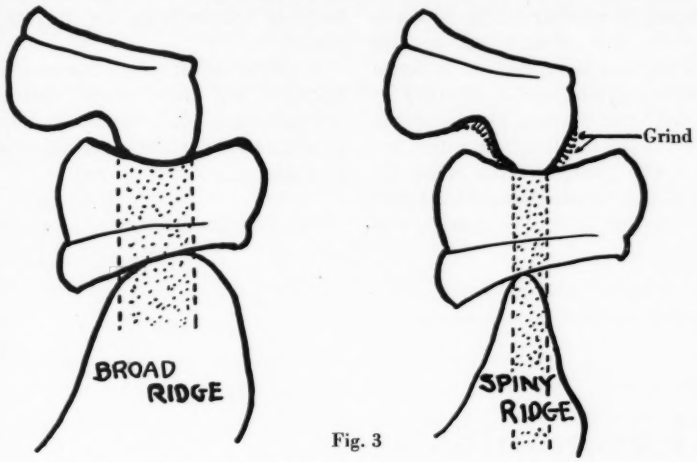


Fig. 3

ANATOMICAL SET-UP

← Force buccal to ridge crest. Less stability.

Wide occlusal contact—more → ridge stress.

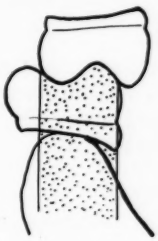
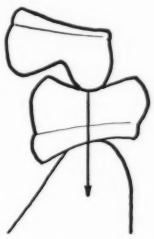


Fig. 4

MODIFIED SET-UP



← Force lingual to ridge crest. Greater stability.

Narrow occlusal contact— → Less ridge stress.

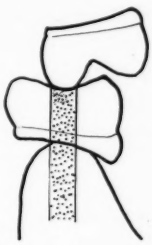


Fig. 5

the same time, leaving a sort of trough from the first bicuspid through the second molar. This completes the major grinding on the lower posteriors.

4. The uppers are ground before setting up. With a similar half-inch stone or one slightly smaller, remove or vee out the transverse ridges of each of the upper posteriors. Remove also about a millimeter of the buccal cusp heights (Fig. 1).

5. Beginning with the upper first bicuspid, set the tooth in position so that its mesial marginal ridge rests on the distal portion of the buccal cusp of the lower first bicuspid.

6. The second bicuspid is set next, with the lingual cusp contacting the trough on the lower and the buccal cusp tipped up slightly.

7. The first and second molars are set in the same way as the second bicuspid, tipping up the buccal cusps still more (Fig. 2).

8. Move the articulator into right, then left lateral.

On the working side, the upper lingual cusps should all touch the lower linguals except the lower first bicuspid. The buccal-to-buccal cusps should be just out of contact. On the balancing side, the lingual cusps of the uppers should all touch the buccal cusps of the lowers (Fig. 2). If these relationships do not exist, it may be that the compensating curve has been in error. Change this curve until the desired results are obtained. When all the posteriors have been set, the case should have multiple balancing and working contacts in lateral movements and have posterior contacts when the incisals touch in protrusion. The patient will have a centric relation to which he will always return without any difficulty because of the fact that flat contacts alone are not had as with the cuspless tooth.

Whether any set of dentures is satisfactory over a period of time is governed to a great extent by "tissue tolerance." By this term is meant the amount of pressure a ridge will stand without breaking down or shrinking. The number of pounds of pressure a patient is able to exert with a set of natural teeth is a great deal more than he can manage with a set of dentures; therefore, in order to cut through the same foods without using as much pressure, it is necessary to cut down the width of the occlusal contacts. This is common knowledge. If dentures are constructed with an occlusion that meets the requirements of "tissue tolerance," no matter by what technique that case is constructed, I believe it will give satisfaction and service. This is a relatively simple problem in the case of broad firm ridges, but the sharp spiny ridge has caused difficulty. By using this set-up, the width of the occlusal contacts can be varied according to the type of ridge and how much it will stand. At the same time, the cutting ability of the sharp or high cusp is retained (upper lingual), without the lateral and protrusive interference that used to exist with these high cusp teeth (Fig. 3). The ease with which the tooth cuts through food, and the narrower occlusal contacts used in the set-up described here cut down shrinkage and pressure on the ridge.

The fact that the cutting cusp is retained but the lower bucco-lingual inclinations are ground to about 20°, eliminates the lateral interference. The upper buccal cusps are out of the way, the upper lingual cusps run in the trough of the lowers. Lateral excursion of the mandible will cause no difficulty.

In the strictly anatomic set-up which might be perfect in every way on initial insertion into the mouth, on settling, would be thrown out of balance by the heavy interference of the lower mesial inclined planes of the cusps against the distal inclined planes of the upper posteriors. This heavy contact had a tendency to pro-

duce a forward movement of the upper denture and a backward skidding of the lower—movements that caused much trauma and therefore additional shrinkage.

This lack of occlusal coordination is not experienced in this set-up. When the dentures settle, the upper lingual cusps simply slide distally in the lower trough a little farther, which has no effect other than to decrease the overjet. The patient does not return in six months with the upper denture shooting forward every time he closes.

Stability is another factor which is helped in the present set-up. By simply shifting the direction of force, this set-up gives greater stability to lower dentures without changing the position of the tooth on the ridge. Instead of the heaviest force being directed at the buccal cusps of the lower posteriors, the force is received by the central fossae, which brings it lingually half the width of the tooth (Fig. 4). More stability is thus gained without encroaching on the tongue space.

If tissue tolerance is considered and patients are given stable dentures, soreness and shrinkage will be reduced, and therefore, dissatisfied denture patients will be fewer.

3049 *Delaware Avenue.*

Leukemias

(*Continued from page* 17)

to Harper Hospital on February 5, 1940. On admission, the blood count showed 2,510,000 red blood cells; 27,000 white blood cells; hemoglobin, 54 per cent; immature lymphoblasts 91 per cent. The temperature was 104° F.

On February 6, the patient received roentgen therapy and on February 7 an indirect transfusion of 200 cc. In the afternoon, he was placed in an oxygen tent but died on February 8, after his temperature had risen to 107° rectally with a pulse rate of 160 and respiration of 32.

Conclusions

Patients suffering from leukemia particularly, or any blood dyscrasia in general, are susceptible to infections of the oral tissues and surgical procedures are contra-indicated except as a last resort. Careful diagnosis coupled with blood and bacteriologic studies are of grave importance when the attending physician and dentist are confronted with generalized glandular enlargements, hemorrhagic tendencies, generalized hypertrophy of gingival tissues or sloughing and necrosis of mucous membranes.

David Whitney Building.

DENTAL MEETING

Dates

The Greater Philadelphia Dental Society, annual meeting, Benjamin Franklin Hotel, Philadelphia, February 4-7.

•

Chicago Dental Society, Midwinter meeting, Stevens Hotel, Chicago, February 17-20.

•

Alabama Dental Association, seventy-second annual meeting. Tutwiler Hotey, Birmingham, April 8-10.

Dallas Mid-Winter Dental Clinic, Hotel Adolphus, Dallas, Texas, April 21-23.

•

Louisiana State Dental Society, sixty-first annual meeting, Hotel Roosevelt, New Orleans, May 1-3.

•

Cleveland Dental Society, annual Spring meeting, Statler Hotel, Cleveland, May 5-7.

•

New Jersey State Dental Association, annual meeting, Berkeley, Carteret Hotel, Asbury Park, May 7-9.

•

Tennessee State Dental Association, seventy-fourth annual meeting, Hotel Andrew Johnson, Knoxville, May 12-15.

•

The Dental Society of the State of New York, annual meeting, Hotel Statler, Buffalo, May 13-16.

•

Georgia State Dental Association, seventy-third annual meeting, Hotel DeSoto, Savannah, May 19-21.

•

South Dakota State Dental Society, fifty-ninth annual meeting, Alex Johnson Hotel, Rapid City, June 15-17.

•

Pennsylvania State Dental Society, seventy-third annual meeting, Bedford Springs Hotel, Bedford, June 3-5.

•

Northeastern Dental Society, twenty-seventh annual convention, New Ocean House, Swampscott, Massachusetts, June 8-11.

(*Continued on page* 40)

The Editor's Page

THERE IS NO condition in modern medicine so unscientific or so unsatisfactory in treatment as that large group of diseases that fall under the title of "chronic arthritis." The authority for this statement is the eminent internist Russell L. Cecil, professor of clinical medicine at Cornell University Medical College. Doctor Cecil pointed out in addressing The Odontographic Society of Chicago that everyone from the humblest housewife to the most erudite physician has some special "cure" for arthritis.

Arthritis, according to Cecil, falls into three general types: First, the infectious or rheumatoid type of bacterial or virus origin, which includes among its causative factors the gonococcus, the pneumococcus, the tubercle bacillus, the streptococcus and the staphylococcus. This is the type of joint disease seen in persons usually under 50. In these cases the joint tissue itself breaks down with involvement of the synovial membrane in the infectious process.

The second type of arthritis has several names: degenerative, osteoarthritis or hypertrophic arthritis. In this condition the disease is in the bone and cartilage and not in the synovial membrane. There is no soft tissue swelling associated with it and the patient may be entirely asymptomatic and free from pain. This is the type of arthritis usually seen in persons past middle life. It frequently develops in joints previously injured, such as the joints of old athletes, and it often involves the weight-bearing joints as exemplified by the arthritis in middle aged women who suffer from the over-weight of the post-menopausal period.

The third type of arthritis is traumatic or mechanical in which there is a direct injury by external force to joint tissues.

There are associated conditions sometimes mistaken for arthritis. These include arthralgias, bursitis, myositis, neuritis.

Dentists are particularly interested in the relationship between dental disease and the infective or rheumatoid forms of arthritis. Teeth, tonsils, sinuses, for example, may break the continuum of the body structure and act as the portals of entry for bacteria to the blood stream to be carried by metastasis to distant parts. We are aware of a causal relationship between foci of infection and certain types of arthritic manifestation. Rheumatic fever, for instance, which is a grave disease of childhood and youth, usually follows an upper respiratory infection. This represents an acute form of focal infection. Ulcerative colitis, as pointed out by Cecil, can also be a focus of infection from which bacteria or their toxins enter the blood stream to set up arthritic disturbances elsewhere in the body. The infection from the gonococcus in the genito-urinary tract with involvement of the joints is another example. The relationship, however, between chronic foci, such as is found in the dental structures, and rheumatoid arthritis is not so plain. We can also say without equivocation that the removal of pulpless teeth or other infectious processes in the mouth can do nothing whatever to help the degenerative form of arthritis.

Cecil found in his own private practice that 70 per cent of the patients with rheumatoid arthritis had no demonstrable foci of infection. It is Cecil's opinion that the theory of focal infection has been greatly overplayed in the last twenty years—almost to the extent of becoming a medical fetish. It has been his experience that myositis and neuritis respond more favorably to tooth removal than do the true cases of arthritis. Cecil made the prediction that the next twenty years will see many more teeth and tonsils left in situ. His revaluation of the theory of focal infection is best stated exactly in his own words: "We have gained a lot of experience from our journey over the by-paths, where we promiscuously plucked all the removable little organs. Now it is time for us to get back on the main road."

Casting Pink Denture Base on Removable Bridges

W. E. WILSON, D.D.S., Springfield, Illinois

DIGEST

As a further development in the casting of plastics (See THE DENTAL DIGEST, June and October, 1940) a polymer-monomer method and a dry heat method are described for casting pink denture base on removable bridges.

The more widely used polymer-monomer method is described in detail in presenting a case of replacement of the upper first and second bicuspid in which extensive alveolar process has been removed and so much absorption has taken place that a gum tint plastic base is required over the saddle.

In this technique there are no flash joints between the two halves of the flasks; thus eliminating the danger of opening the bite: The saddle and the teeth are completely encased in the investment, so that they cannot be opened.

Labor is halved in that the case comes out clean as an exact reproduction of the waxed case, by forcing the plastic through the sprue hole with the proper amount of compression.

This casting technique may be adapted to the following types of partial denture construction: (1) the upper first and second bicuspid; (2) the lower first molar close bite bar; (3) the upper first and second bicuspid when thin porcelain facings are used with tooth shade plastic on lingual and occlusal; (4) the close bite full lower partial; and the lower lingual bar with pink denture construction.

Fig. 1—Checking metal casting on model preparatory to waxing. Note diatoric teeth to be used on case.

NOT ALL REMOVABLE bridges are full-cast in metal. In many cases it is necessary to construct the saddle areas of vulcanite or one of the new acrylic base materials. The usual technique for removable bridges when acrylic resin with a cast metal frame is used is to process the material by the methods used in full denture construction. Frequently in this molding procedure the bite is opened. By adapting the casting technique[1] for acrylic materials which has been used for the construction of acrylic inlays, crowns, bridges and bridge pontics, it is possible to construct acrylic saddled for removable bridges.

There are three advantages to this method:

[1]Wilson, W. E.: The Casting of Plastic Inlays and Crowns, DENTAL DIGEST, 46:202 (June) 1940; The Casting of Plastic Bridge Pontics, Ibid. 46:340 (October) 1940.

Fig. 2—Removing waxed case from model. Sprue is shown.

1. There is no flash joint between the two halves of the flask. In the use of the method to be described here the gold framework for the removable bridge and the teeth are entirely encased in investment and thus the relationship of the parts cannot be altered. By forcing the plastic material through the sprue hole, by a casting technique with the proper amount of compression and force, an exact reproduction of the waxed up case is assured.

2. The labor factor is halved. In the casting technique it is not necessary to open the flask and tin-foil the case as in the split flask molding technique. The case comes out clean, so that there is little finishing to be done. Additional time is saved as there is only one mixing and pouring of the investment into the flask.

3. The most important advantage is the assurance that the bite relationship will not be altered or changed.

Because of the versatility of the acrylics, two simple methods have been developed with the use of the same casting machine that is used for inlays, crowns and bridges.[1] Inasmuch as the polymer-monomer method is more widely used by the profession at the present time, a practical case of replacement of the upper first and second bicuspid employing this method is herewith described.

Technique

Let it be assumed that extensive alveolar process has been removed and a tremendous absorption has taken place requiring the use of a gum tint plastic base over the saddle.

1. An impression of colloidal material is made of both the upper and lower arches. These are poured with a hard die stone for master models.

2. A strip of wax 2 mm. high and 3 mm. wide is placed on the ridge between the distal of the cuspid and the mesial of the first molar, so that when poured, it will leave a raised bar upon the casting model.

3. A colloidal model is taken of the upper arch on the side to be replaced, and poured in casting investment.

4. The case is mounted on an articulator preparatory to waxing.

5. Diatoric teeth of proper shade and size are selected and ground, about 1 mm. or 2 mm. being left over the saddle bar.

6. The saddle and bar and clasps

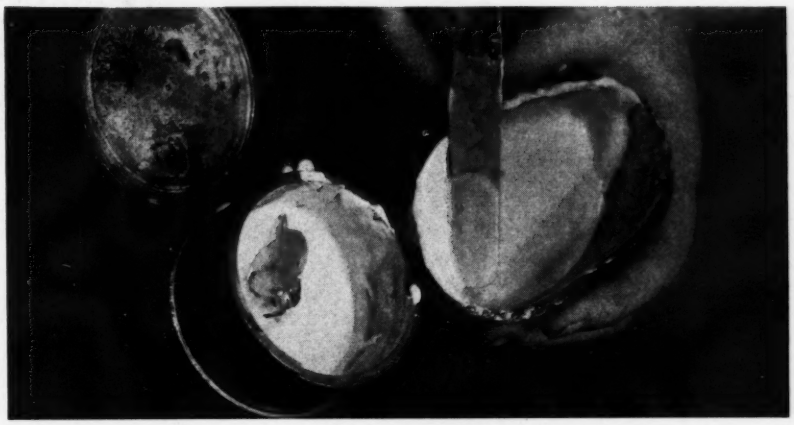


Fig. 3—Investing case in split-wall flask.

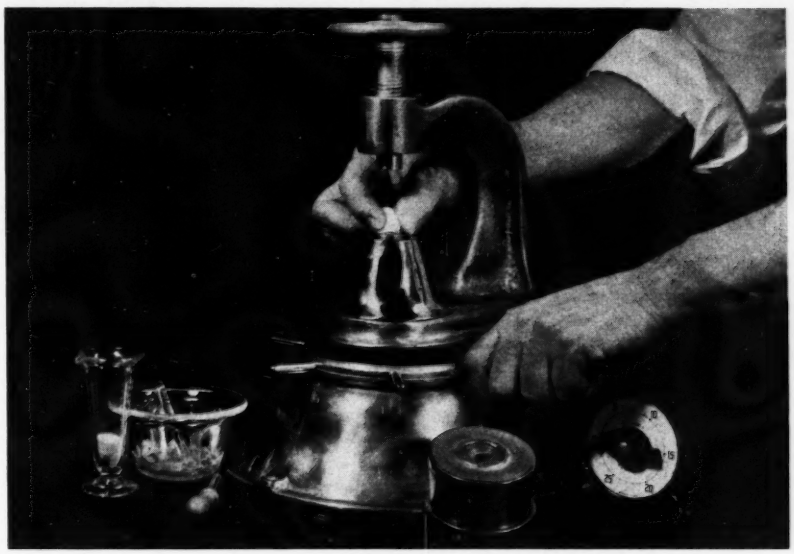


Fig. 4—Placing pink denture base in heating chamber of casting machine.

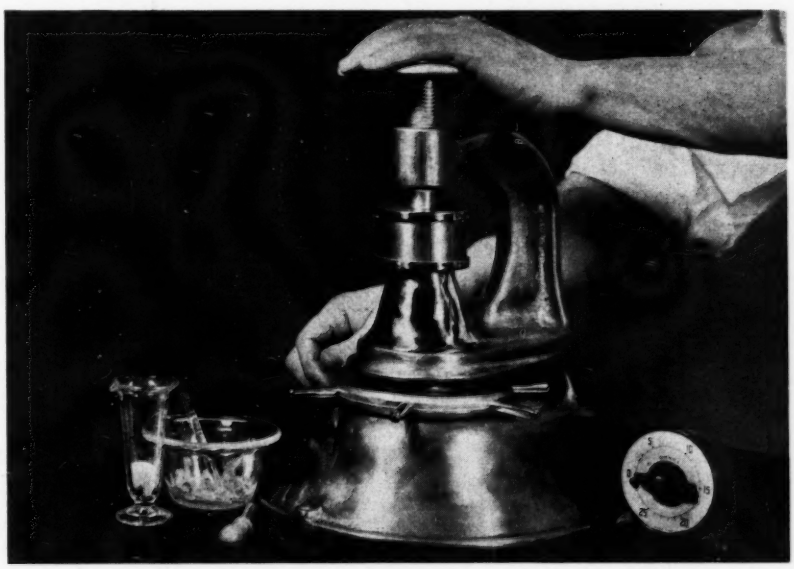


Fig. 5—Casting pink denture base. Flask clamped over heating chamber.

are waxed for the casting of the gold frame. Many variations of castings may be used to suit the individual case.

7. After the casting frame has been made and polished, it may be placed in the mouth and checked for any desired corrections.

8. The casting is placed on the model with the teeth in place, and waxed as desired for placement of pink acrylic on the frame. It is not necessary to over-wax, as the case comes out clean in casting plastic.

9. Clean the wax with solvent and polish. The case will come out only as clean as the carefulness with which the waxing was done.

10. Place a large, clean, smooth sprue-former on the lingual side, making sure that it is securely anchored in wax, so that it will not break off when pouring is done.

11. Remove the case from the model carefully. This can only be done when no undercuts are present in the case being constructed. If the operator does not wish to remove the case, it may be cast upon the master die.

12. *Investing*—A. Prepare a thick mix of the same investment that is used for bridge pontics.

B. Paint over all surfaces of wax with a camel's hair brush, and vibrate.

C. Place the sprue in the sprue hole in the lower half of the flask.

D. Place the split walls of the flask on the lower flask and pour in investment. (The split-wall flask is the same one used in casting inlays and crowns except that it is of larger capacity.) The top of the flask is put in place.

E. Let the invested case set for thirty minutes; then, remove the sprue and boil out the wax. The entire case will now be inside the mold and it cannot be opened. In this technique it is not necessary to open the case inasmuch as the teeth and gold casting will stay in place without moving or shifting when casting the plastic.

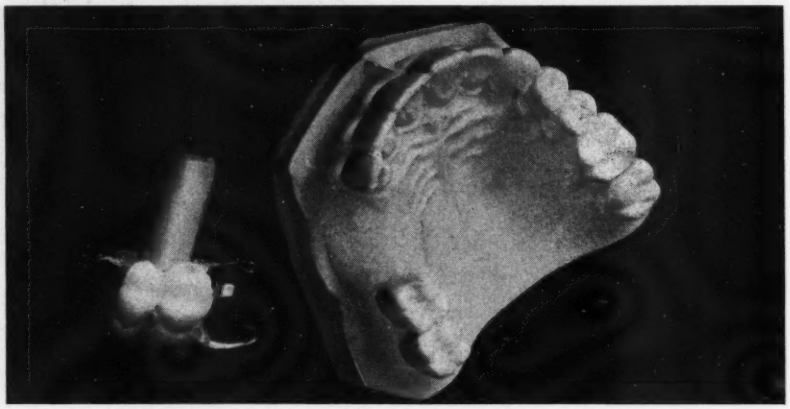


Fig. 6—Finished case after it has been removed from investment.

F. Let the mold cool to room temperature. At this time a liquid separator is injected into the sprue hole and allowed to be absorbed into the investment for a few minutes. The forced air is blown into the sprue hole to remove excess. There will thus be no sticking to the investment after the casting of the plastic is made.

G. The proper amount of pink polymer is weighed and thoroughly mixed with the proper amount of monomer, as would be done in the present hand-packed method. The mass should be a little stiffer than is used in the hand-packed method inasmuch as the more monomer taken up either by absorption or evaporation, the better.

H. When the flask has cooled to room temperature, place pink base mix into the casting chamber and clamp the flask over it with the sprue hole down, so that the plastic may enter through the sprue hole when casting.

I. Turn the wheel at the bottom of the casting machine, forcing the doughy mass into the mold; then, turn on the heat of the casting machine; set the time clock for about forty-five minutes. The heating element will gradually heat the flask, creating a controlled steam in the investment with the proper internal pressure.

J. Remove the flask and let it cool to room temperature.

K. Remove the case from the investment.

13. *Finishing and Polishing*—The finishing and polishing procedure is the same as in any other denture construction. The partial is placed on the master model and the occlusion is checked and spot-ground. The case is placed in the mouth and corrections are made.

Dry Heat Method

The same procedures employed in the polymer-monomer method are used in the dry heat method in sprueing, investing, and boiling out the wax. The mold is dehydrated to evaporate all the water from the investment, as in the crown and inlay technique, and gradually heated to 400°F.

At this point, pink denture base methacrylate is placed into the heating chamber and brought to a viscous or flow point. The properly heated flask is placed over the heating chamber and plastic is forced into the mold through the sprue hole. The flask is then removed and allowed to cool gradually.

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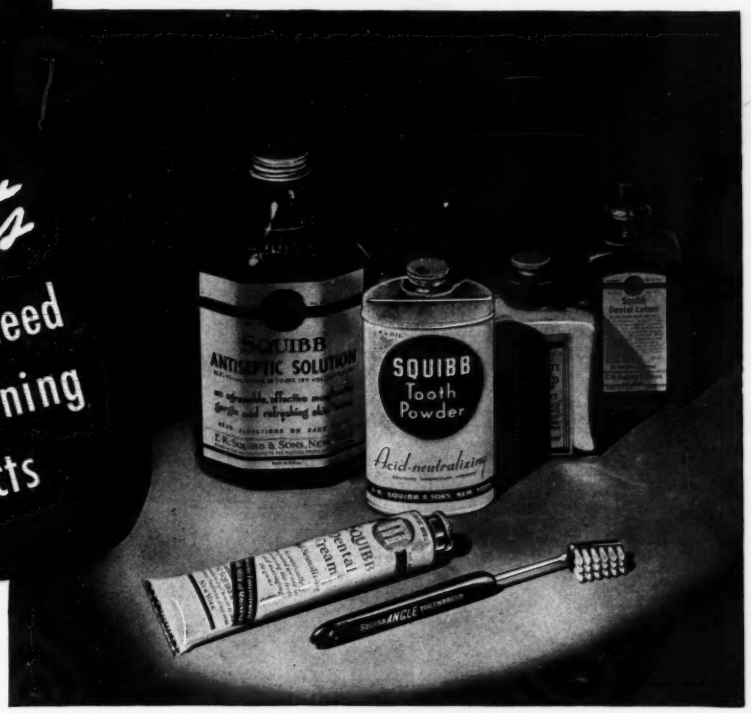

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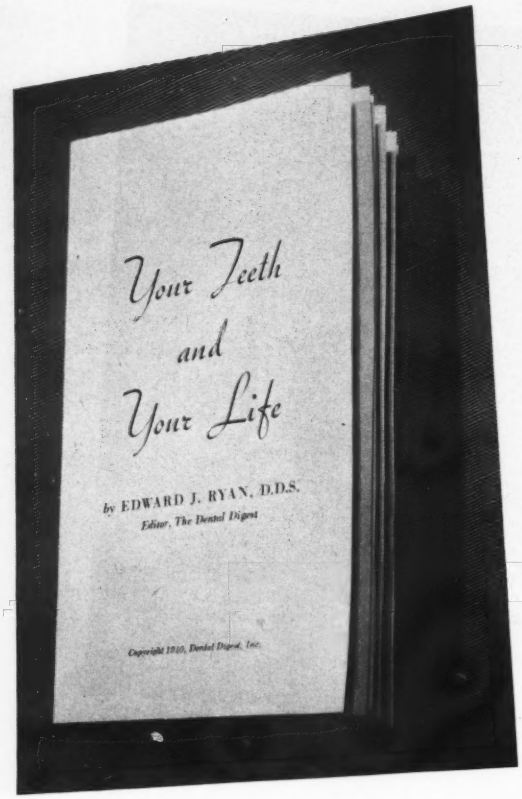

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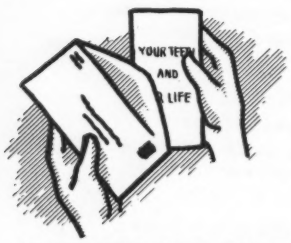

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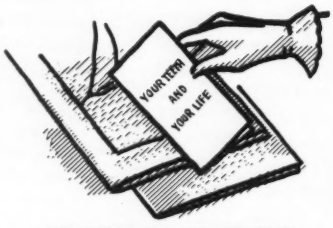

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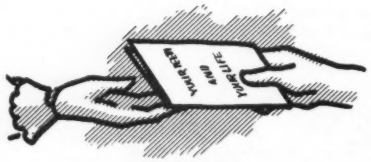

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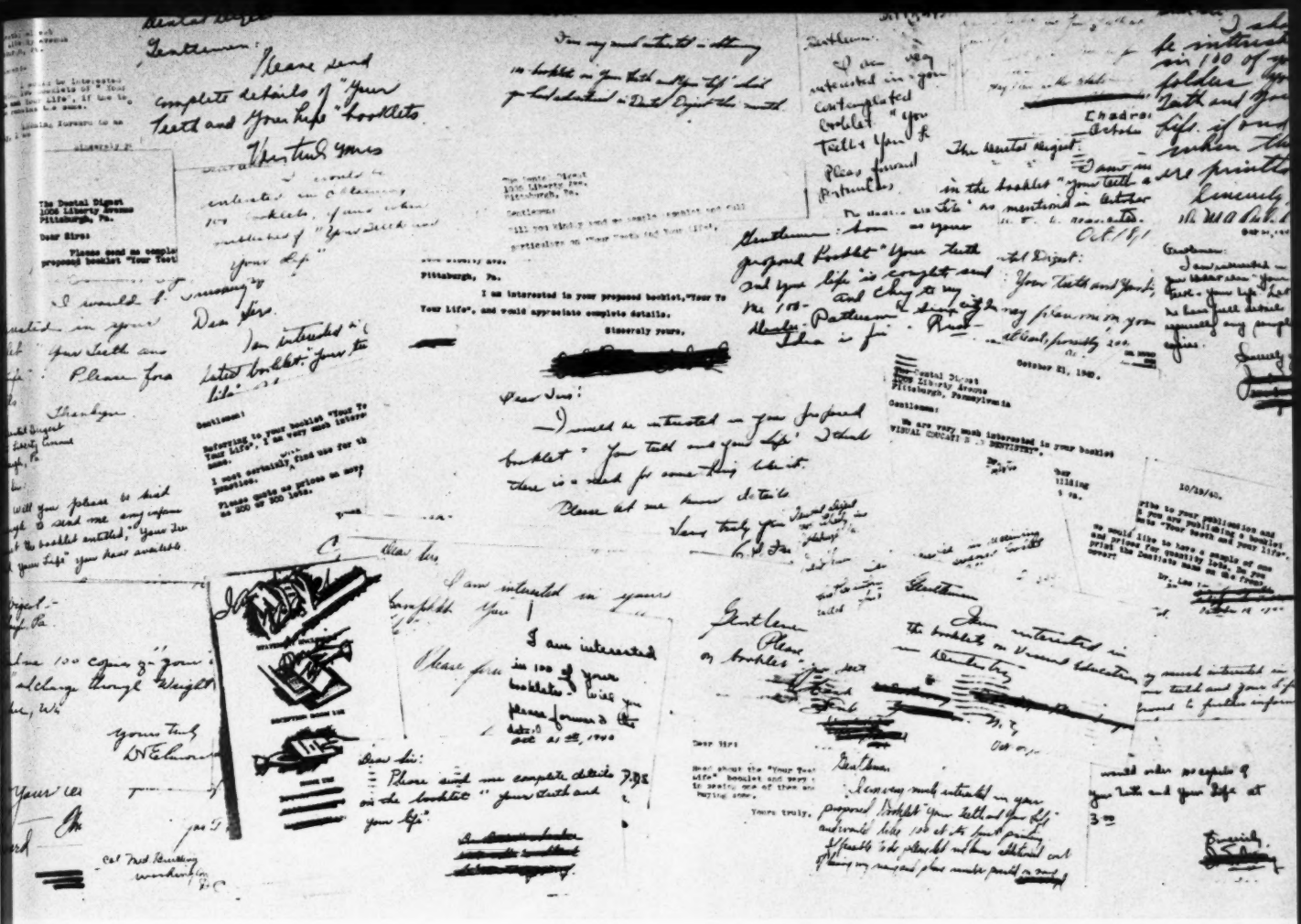

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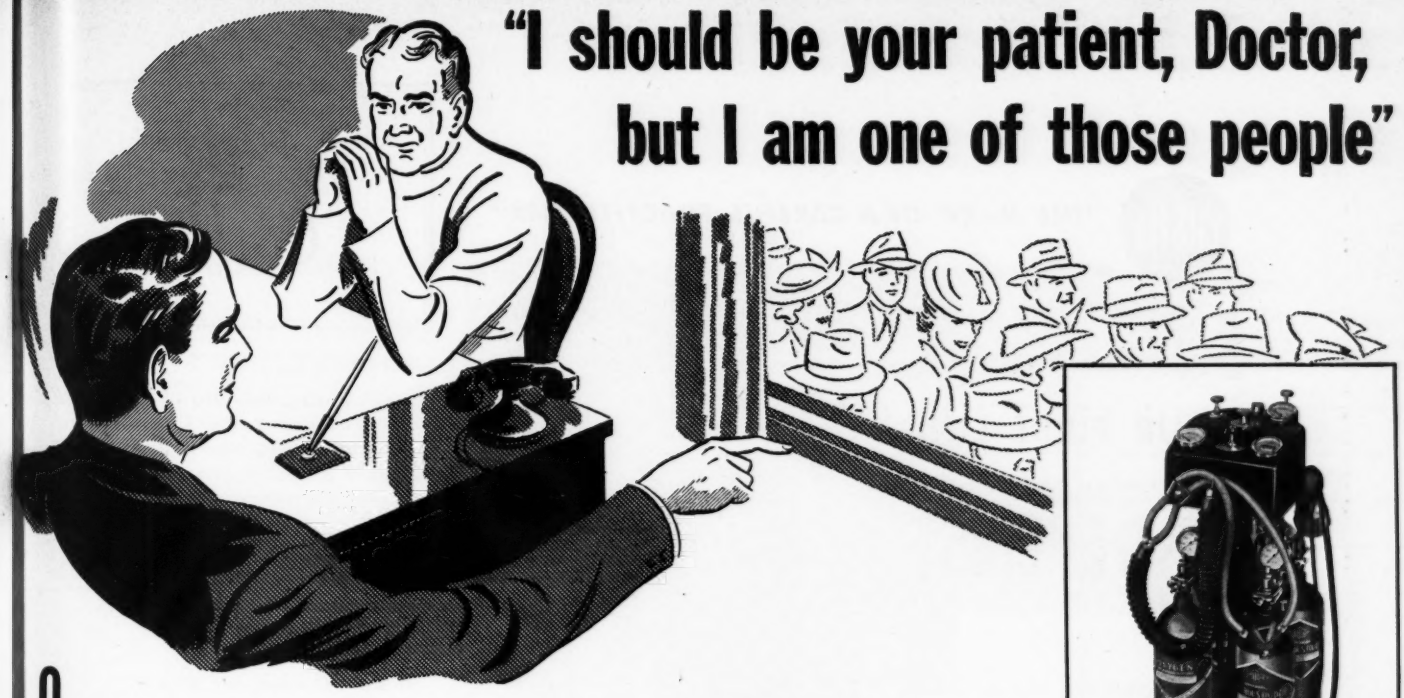

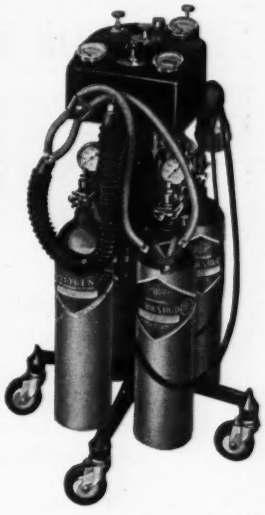

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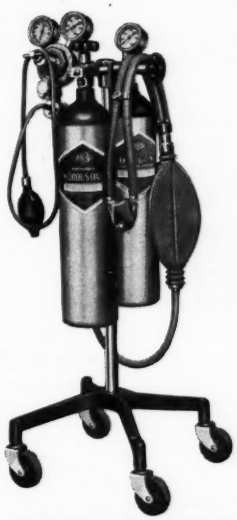

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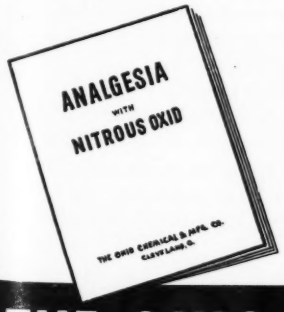

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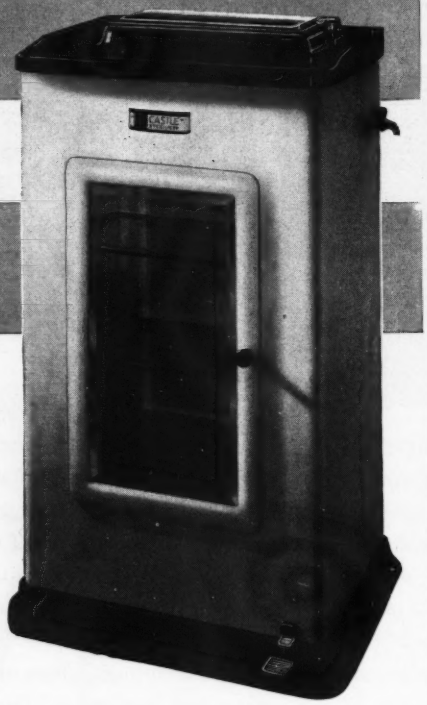

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NOTES ON THE *Cuff*

Vitamins . . .

The changing geography of Europe is no more confusing than the evolution of terminology in the vitamin field. *Nutrition Research* gives this list of our old vitamin friends with their new handles:

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Pro-vitamin A—Carotene
Vitamin B_1—Thiamin
Vitamin B_2(G)—Riboflavin
Vitamin B_6—Pyridoxine
Vitamin C—Ascorbic acid
Vitamin D—Calciferol
Vitamin E—Tocopherol (s)
Vitamin K—Phthiocol
Vitamin P—Citrin
Pellagra Preventive—Nicotinic acid
Dermatitis factor — Pantothenic acid.

Words . . .

It is no new thought that words are both tools for good and instruments for evil. Every word might be said to have two aspects of meaning: a denotation and a connotation. We can all pretty well agree on the denotation of a word; for example, the word dog denotes a four-footed mammal of the canine family; but the connotation of the word dog depends entirely upon our past experiences and our emotional patterns. If, sometime in our past, a dog was faithful and loving the word dog brings from our memory when we hear it used a feeling of agreeableness and a warm surge of pleasurable emotion. If, on the other hand, sometime in our past a dog gnawed at the seat of our pants, the emotion produced by the word dog, the connotation, is disagreeable and unpleasant.

An excellent example of how simple words can be used to set up unfavorable emotions is this short news story from *Medical Economics*:

"P. H. S. Eyes Dentistry

"Dentistry is due to be placed under Federal scrutiny, if a bill recently introduced in Congress is passed. The measure has been approved by the Senate without discussion. It confers

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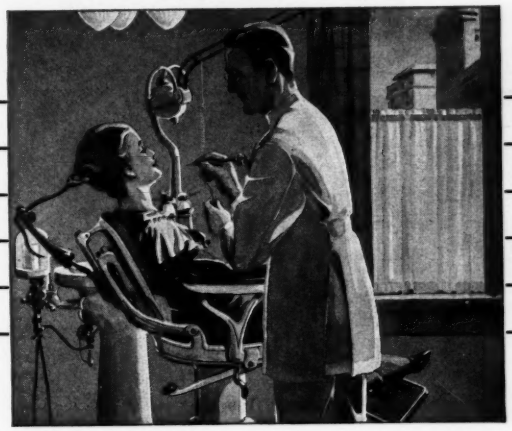
TRUBYTES



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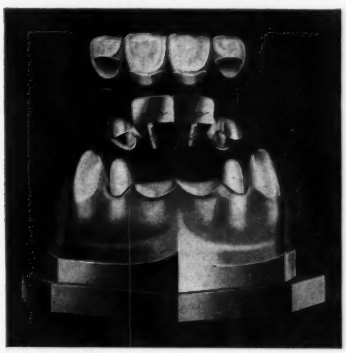
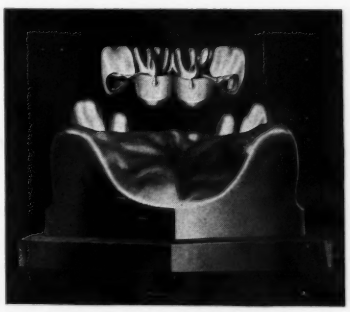


Steele's Trupontic, the tissue contact restoration is famous among these practical improvements. Trupontics, offering a glazed porcelain surface in contact with the mucosa are, when properly adapted, the most esthetic and hygienic type of bridge tooth available to dentistry today.....



Further information on Trupontics is available, to you Doctor, at your request.

The COLUMBUS DENTAL MFG. CO., • COLUMBUS, OHIO, U. S. A.

In your ORAL HYGIENE this month

QUICK QUIZ

Suppose that—before you ever studied dentistry—you were forced to serve as dentist in a German concentration camp? (That happened to Curt Daniel, who tells about it in a remarkable article in January ORAL HYGIENE—page 23.)

What is the "wide gulf between the Torch and Mace ceremony and the worthwhile activities of the American College of Dentists?" Seth W. Shields answers that question this month—page 32.)

Is there any chance of dentists ever benefiting by the federal security program? (Read what W. A. Moline has to say about it—page 39.)

What is the A.D.A. doing about dentistry's part in the preparedness program? (Turn to page 43 this month.)

If you're of draft age, what can you, as a dentist, do about it? (Some answers to dentists' questions—page 45.)

What's best to do in case of tic douloureux, sensitive teeth, erosion, mouth breathing? (Answers to these, and other questions, by Doctors Smedley and Warner—page 55.)

Curt Daniel, April, 1938, immediately before entering the Concentration Camp.

Does the technique of establishing the bite ever trouble you? (Doctors Craig and Hyde suggest technique, in "picture-writing"—21 pictures—page 58.)

And don't miss this month's editorial, "Remember The Dental Cosmos," and the departments "Dentists in the News" and "Laffodontia."

This month, the Corner (page 2) tells why the celebration of ORAL HYGIENE's 30th anniversary is confined to some type changes in text pages and a new cover design.

Oral Hygiene

FOR JANUARY

sweeping investigatory powers upon the Surgeon General of the Public Health Service. He is authorized to probe the 'most effective methods of prevention and treatment of [dental] diseases'; and after that, to promote their 'prompt, widespread use.' The studies would be financed by an allotment of $75,000 for the fiscal year ending June 30, 1941, and appropriations would be pyramided at the rate of $10,000 additional per year for five years."

Now when we analyze this story, we find emotionalized expressions slipped in to set up in the reader's mind antagonisms, suspicions, condemnations, fears. In this one simple paragraph at least six examples of words and expressions tending to incite emotional reactions have been employed: *eyes dentistry; Federal scrutiny; approved by the Senate without discussion; sweeping investigatory powers; to probe; pyramided.*

If this paragraph were rewritten as a straight news story without emotionalized word groupings, it might read something like this, with far different effect on the reader:

"Pubic Health Service and Dentistry

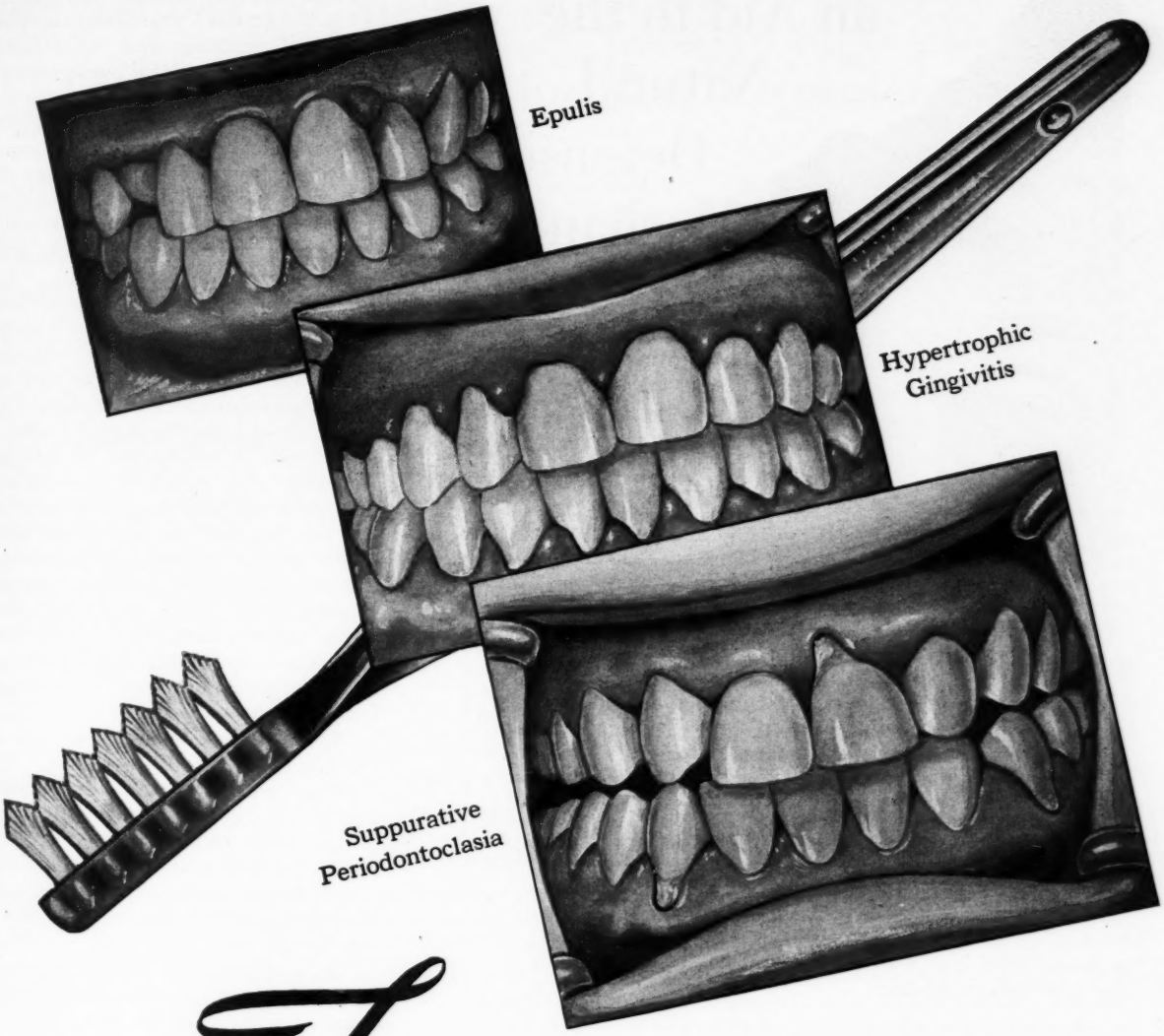
"A bill providing for the extension of the functions of the dental division of the United States Public Health Service has recently been introduced in Congress by Senator Murray of Montana. The measure has already received the approval of the Senate. Under the provisions of the bill the Surgeon General is to survey and study the 'most effective methods of prevention and treatment of dental diseases'; and the results of this undertaking are to be employed toward the promotion of 'prompt, widespread use' of such methods of prevention and treatment. An appropriation of $75,000 for the fiscal year ending June 30, 1941 is asked for to finance these studies, with an additional $10,000 per year for five succeeding years."

The fact is that this bill has the entire approval and support of the Amercian Dental Association and was introduced into the Congress by Senator Murray at the instigation of the American Dental Association.

How to Listen to a Lecture . . .

Mr. Mortimer Adler has recently published a very popular book on HOW TO READ A BOOK. Someone has a fine opportunity to do a similar service on how to listen to a lecture.

(*Continued on page* 36)



the Toothbrush as a Factor in the treatment of Various Oral Conditions

Dental authority cites the value of the tooth brush as supplementary therapy in the treatment of suppurative periodontoclasia, chronic hypertrophic gingivitis, recurrent epuli and hypertrophied papillae, etc., to stimulate gingival circulation and to raise tissue resistance. For treatment or prophylaxis, your patient will receive . . .

Maximum Tooth Cleaning and Gum Massage Effect with

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A scientifically designed handle-twist makes practically automatic correct placement of brush for better massage and brushing. The compact brush head, (with tufts widely separated) reaches concavities, convexities and planes of dental arches. A non-skid thumb-rest gives balanced manipulation.

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an Aid to the Natural Defense Mechanism...

WHILE it is obvious that no antiseptic will completely kill all of the bacteria found in the oral cavity, nevertheless, infections in this area may be prevented or beneficially treated by the use of a non-toxic, non-irritating antiseptic.

'S.T. 37' Antiseptic Solution is of particular value in these conditions because it possesses high germicidal activity, but at the same time has a very low tissue toxicity. Thus, many of the bacteria are not only killed by chemical means, but the defense mechanism of the tissues against infection is not disturbed. In addition, 'S.T. 37' Antiseptic Solution exerts a surface analgesic effect.

Thus, the therapeutic action of 'S.T. 37' Antiseptic Solution is three-fold when used for routine antisepsis or as a wet dressing or irrigating solution:

1. **It exerts a marked bactericidal action.**
2. **The normal physiological activities of the tissues are not affected.**
3. **A mild surface analgesic action is produced.**

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Now that the advantages of Ammoniacal Silver Nitrate have become so well known it is being extensively used

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or

whether you want information on the materials and equipment which are used to the best advantage, write to:

P. N. CONDIT • Box 204, Back Bay • Boston, Mass.

(Or use coupon on page 44)

These suggestions might be included:

1. Determine, if possible, the pattern of thinking that the lecturer follows—if, indeed, he has a pattern at all. Does he, for example, begin the discussion of a point; then wander around Robin Hood's barn, never to return to the place of beginning? Or, does he partition or set off item by item and discuss each point completely, or partly with the promise to return to the item later?

2. Try to ascertain how the lecturer employs his words, whether his vocabulary is purposeful or given to ambiguities; whether his words suit his meaning or are apt to be misconstrued and lead to communication failure.

3. Having determined as well as possible the lecturer's pattern of thinking and ascertained his method of expression, try to think in his pattern and in his terminology rather than in your own thinking grooves and speaking habits. This will facilitate understanding of the lecturer's point of view which must first be grasped before any specific facts can be correctly noted.

4. These steps of adjustment to a lecture must be made quickly and deftly; otherwise, the lecture will have ended before you have begun to listen comfortably.

5. Throughout this attempt to establish the mental processes and technique of presentation, the listener should have pencil and paper in hand and decide on his own method of outlining his notes, leaving large spaces under each heading for the speaker who wanders around and finally returns to his point, and filling out each point in the outline fully for the speaker who completes each thought before proceeding.

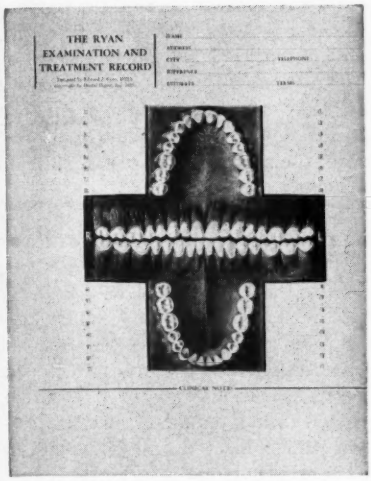
6. After the lecture, review the notes while they are still hot and if so disposed, write in your own words an interpretation of the lecture. This suggestion is a good one for self-discipline to dentists who are not generally pencil pushers. They dislike to take notes or write letters. They even dislike bookkeeping.

Good News from Michigan . . .

William R. Davis, the able director of the Dental Division of the Michigan Department of Health, has been honored by being chosen President-Elect of the Michigan Public Health Association. This is the first time that a member of the dental profession has been elected to this high office in

Suggestions for the use of

The Ryan Examination and Treatment Record



TYPES OF PENCILS

Yellow	Mongol No. 867
Gray	Mongol No. 819
Red	Mongol No. 866
Blue	Mongol No. 865
Yellow	Castell No. 40
Gray	Castell No. 57

Mongol pencils are made by Eberhard Faber; Castell by A. W. Faber.

SUGGESTED SYMBOLS

Each dentist may develop his own system of symbols but the following specific markings have been found simple aad adequate:

Soft Lead Pencil—(a) Porcelain fillings are indicated by a pencil outline.

(b) Porcelain jacket crowns and bridges are shown by cross-hatching with lead pencil across the corresponding tooth or teeth on the chart.

(c) Missing teeth are blocked out with a soft lead pencil.

(d) Abrasions are represented with a soft lead pencil.

Blue Pencil—(a) Cavities are indicated with blue pencil.

(b) Advisable restorations are demonstrated with blue pencil.

Red Pencil—(a) A red line is used to indicate the presence of a root canal filling.

(b) A red outline shows the presence and position of an impacted tooth.

(c) Red pencil is used to represent pulp involvement.

(d) A red "X" is made across a tooth to indicate that its extraction has been advised.

(e) Pyorrhea pockets are represented in red along the crest of the alveolar ridge (and a notation is made at the bottom of the chart if extensive gingivitis is present).

1. The Ryan Examination and Treatment Record may be had in pads of fifty charts each. These pads fit conveniently in a standard 9½ by 11½ inch loose-leaf notebook which may be purchased at a five-and-ten cent or variety store.

2. Alphabetical dividers may be made by using a ten cent package of plain white paper of the same size as the charts with holes punched at the same distances, and a fifteen cent box of alphabetical index tabs. The holes are reinforced.

3. It is a good plan to keep a blank sheet of paper between the charts to prevent possible smearing of crayon or pencil markings; but this is not essential.

4. A fresh pad of charts may be kept ready for use in back of the notebook of active records.

5. The various types of restorations and their location in a particular mouth are shown with the use of polychrome pencils—gray, for amalgam; deep yellow, for gold. White pencil does not show up very well; consequently, porcelain may be indicated with soft lead pencil outlines or cross-hatching.

6. Spaces provided beside the quadrants with numbers corresponding to the teeth permit special notations concerning each tooth. As treatment progresses the blue markings indicating needed dentistry are erased, and the nature, location, and date of placement of each new restoration are recorded. Additional clinical notations are made if necessary in the space provided for that purpose below the chart itself.

7. It is essential to be consistent in any system of symbols or markings developed. To insure consistency, it is well to have a key page in the front of the notebook

8. The exact record of conditions found in the average patient's mouth at the original examination can be completed in fifteen or twenty minutes, and the time it takes to keep a chart up to date is negligible.

9. When a chart is completed the necessary data (name, address, telephone, reference, estimate, and terms) are typewritten in the spaces provided at the top of the record. The date of the original examination is also recorded in order that the treatment dates (as shown in the quadrants at the sides of the chart) will be recognized as subsequent to the date of the original examination.

10. Provision is made on the back of the chart for bookkeeping records. This is merely for the convenience of dentists who wish to keep all records together, but may be ignored by dentists who have a satisfactory bookkeeping system which they need not and do not wish to discard. The Ryan Examination and Treatment Record may be employed as an additional or supplementary record to any established method of record-keeping dentists may have.

11. Although the Ryan Examination and Treatment Record was designed for the dentist's own convenience in his practice, the charts have been found to have a definite informative value in explaining conditions to patients. The charts are also particularly helpful in reporting dental conditions of patients to cooperating physicians.

THE DENTAL DIGEST, 1005 LIBERTY AVE., PITTSBURGH, PA.

Here is $1.00. Please send me a pad of 50 Ryan Examination and Treatment Record Charts.

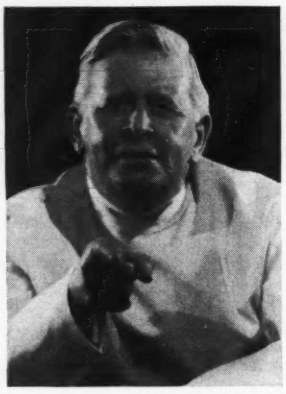
Dr.....Address.....

City.....State.....

(Or please use coupon on page 45)

If you have not ordered your charts, clip the coupon, and mail with a dollar bill.

What Shall I Recommend for Smoke Smudge?



"How can I get rid of smoke stains?"—is a frequent question in dental offices today.

IODENT No. 2 will prove to be a satisfactory answer in most cases.

IODENT No. 2 differs decidedly from other tooth pastes in its peculiar texture. Its ingredients are soft—smooth, velvety—perfectly harmless to the most delicate tooth and gum structure.

Yet, its texture or consistency is heavy, clinging, tenacious. It doesn't foam up readily under the brush. It keeps its form, clings to the bristles, aiding them effectively in gently but firmly erasing the accumulations and smudges from tooth surfaces.

We suggest several recommendations where you have the opportunity of watching results.

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Made by a Dentist

the state of Michigan. The honor deservedly goes to Bill Davis and to the profession of dentistry as well.

American Academy for Plastic Research in Dentistry . . .

Out of the Greater New York Dental Meeting has come a movement which portends well for the future of dentistry. Some of the pioneer authorities on plastics, each of whom has been researching in his own plot of the field, have decided to coordinate their efforts by organizing an Academy.

Plans for the organization have recently been completed in Chicago, and the American Academy for Plastic Research in Dentistry will hold its first official meeting on Sunday, February 16, 1941, at the Stevens Hotel in conjunction with the annual Chicago Dental Society Midwinter Meeting. At that time a permanent staff of officers will be elected and plans will be made to stimulate future research.

One original piece of research in plastics is the entrance requirement. The Secretary, pro tempore is Doctor La Mar W. Harris, 25 East Washington Street, Chicago.

Self-Query . . .

When a patient knocks the services of a previous dentist, ask yourself the question, "How much does he owe the other dentist?"

Writing Letters to the Editor

Writing letters to the editor is a fine way to relieve one's hypertension and pour out the spleen. We expect readers to engage in this avocation and if they did not we would be greatly disappointed and fear that the publication was being tossed unread into the wastebasket. There isn't, of course, a magazine that comes from a printing press that doesn't have something annoying to someone. Occasionally we have someone write to tell us what chumps and imbeciles we are for publishing a certain article. Usually these people are axe-grinders who have a competitive product to sell, a gadget to force upon the public, a pet technique to defend. Occasionally they are just disagreeable malcontents.

We always like to point out to all letter writers and all readers that an editor is not a censor. He has no right to set himself up on a little throne and decide with great gusto and finality what is good and what is bad. If a

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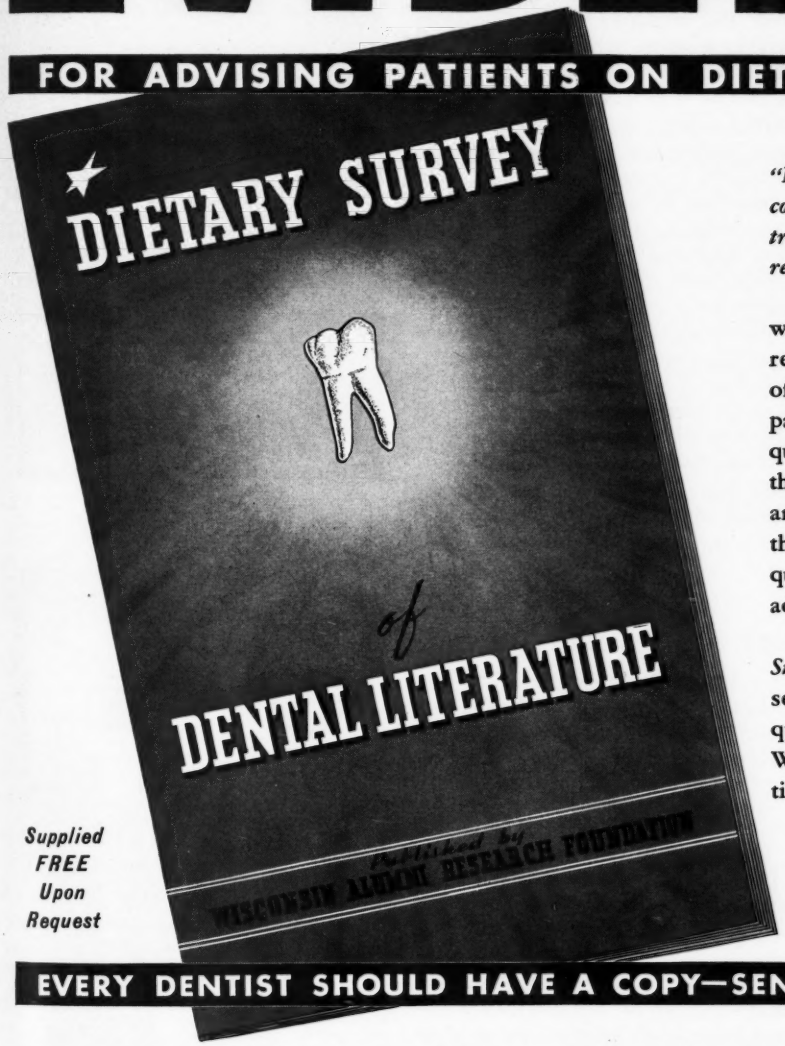

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This is the inescapable conclusion which must be drawn from a considered reading of the booklet—"Dietary Survey of Dental Literature." Here is a sixteen-page, fact-packed compendium of actual quotations on the subject gleaned from the recent writings of twenty national and world authorities. In the light of these opinions, the importance of adequate Vitamin D in the diet takes on added stature.

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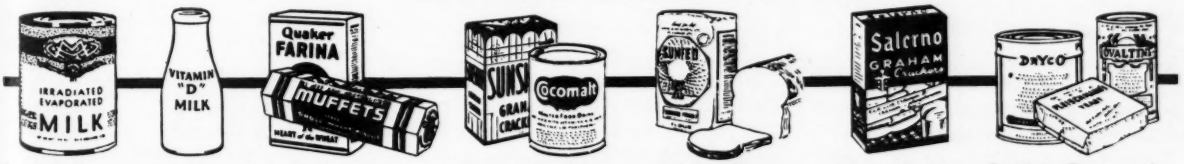

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Cocomalt, Sunshine, and Johnston Graham Crackers—good sources.

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Salerno Graham Crackers—enriched with Vitamin D.

Ovaltine, Dryco and Fleischmann's Yeast—good sources.

Also Viosterol and Viosterol-fortified medicinals prescribed by physicians

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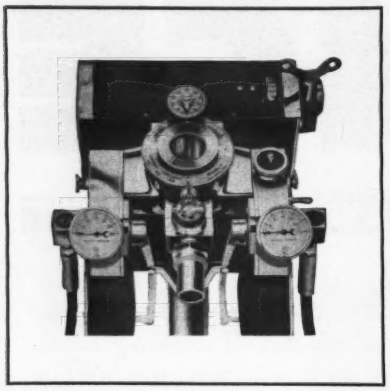
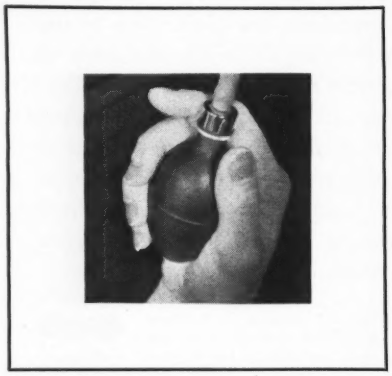
For COMPLETE PAIN CONTROL



For exodontia, surgery or for routine procedures in general practice the Nargraf provides an efficient, simplified and economical means of controlling pain. In anesthesia the technique is greatly simplified by the "single valve" dosage control which controls the volume of both nitrous oxid and oxygen; and the intermittent flow principle which coordinates the flow of gas with the patient's respiration.



For analgesia the Nargraf can be equipped with a patient-control bulb with which the patient controls the flow of gas, thus administering sufficient gas to promote analgesia and control pain in such operations as cavity preparation, prophylaxis, scaling and other routine instrumentation. For both anesthesia and analgesia the Nargraf reduces the technique to its simplest terms and provides economy in gas consumption available in no other gas dispensing apparatus.

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story is told by a responsible person in a sincere and sound fashion, if it is substantiated by some evidence—then, regardless of how revolutionary or how precedent-breaking it is, it deserves to be presented. After publication, all the bars are down and the author and the editor are both open to any attacks that may be directed against them. The attackers, however, should constantly bear in mind that demands to curtail free expression may become boomerangs to prevent the attackers themselves from having a voice. Whenever a suggestion is made to curtail free expression, it means that everyone's rights are threatened. An editor is not a policeman. He is not a judge nor a jury. He is merely a person who attempts to select from all corners of the country the material that comes across his desk which he thinks can be put into a form with purpose and meaning to his readers.

An editor might do well to have a sign painted on a wall in his office, carrying a statement by Howard Vincent O'Brien, who wrote on the birthday of a mellow octogenarian: "He seems to have had the curious idea that his own soul was a large enough area for one man to police."
—E. J. R.

DENTAL MEETING DATES

(*Continued from page* 22)

American Academy for Plastic Research in Dentistry, first meeting, February 16, Stevens Hotel, Chicago.

•

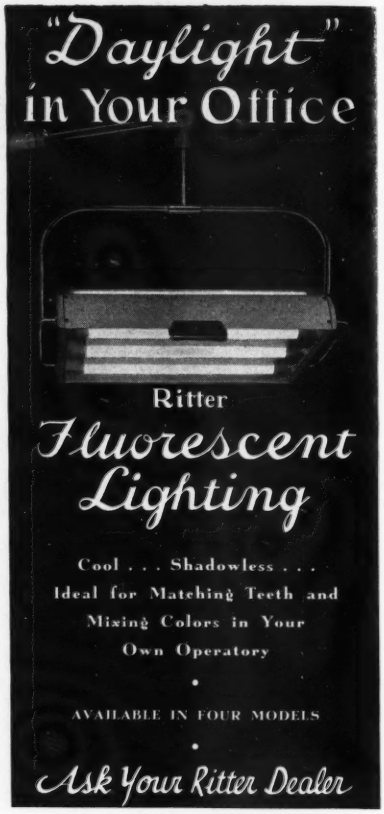
Utah State Dental Association, fifty-first annual meeting, Salt Lake City, June 26-28.

•

Florida State Board of Dental Examiners, regular meeting, Jacksonville, June 23-27. Applications must be filed by April 23. For information write to Doctor H. B. Pattishall, 351 St. James Building, Jacksonville.

•

New Jersey State Board of Dental Examiners, regular meeting, June 23-27, Trenton. Application must be filed by March 15. For information write to Doctor W. A. Wilson, 148 West State Street, Trenton.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